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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
HELIUM ACTIVITY
HELIUM RESEARCH CENTER

INTERNAL REPORT

COMPRESSIBILITY DATA FOR HELIUM OVER THE TEMPERATURE RANGE

-5° TO 80° C AND AT PRESSURES TO 800 ATMOSPHERES

BY

Ted C. Briggs

BRANCH Fundamental Research

PROJECT NO. 7005

DATE August 1969

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Ted C. Briggs[1/]

ABSTRACT

Twenty-two compressibility runs were made with helium over the temperature range -5° to 80° C and at pressures to 800 atmospheres. A Burnett apparatus was used.

Data from the runs were fitted to a fourth degree polynomial equation in the pressure and a weighting factor of $P_r^{-3/4}$ was used. All data for a particular isotherm were treated simultaneously. A temperature function was found to represent the parameters B and C.

Compressibility factors determined by this investigation are believed to be accurate to better than 0.05 percent.

INTRODUCTION

This work is part of the Bureau's broad program for the determination of accurate compressibility data for helium and helium-containing mixtures.

1/ Research chemist, Helium Research Center, Bureau of Mines, Amarillo, Tex.

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This work is part of the Bureau's broad program for the determination of accurate compressibility data for helium and helium-containing mixtures.

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Accurate compressibility data are required for the development of an equation of state for helium and its mixtures. Also, thermodynamic properties can be derived from the data.

These accurate data will permit a more precise and economical design of plants for the separation and purification of helium. Accurate data have immediate applications in the Bureau's helium conservation program and are also of value to some industries and universities.

The data were obtained by use of a Burnett (6)[2/] compressibility apparatus.

2/ Underlined numbers in parentheses refer to items in the list of references at the end of this report.

The experimental apparatus, experimental procedures, and the method of reduction of the experimental observations are described in a previous report (4).

Little experimental data are available in the literature on helium over the temperature and pressure range of this work. Only Wiebe, Gaddy, and Heins (10), Blancett (3), and Johnson (8), have published data to pressures of 500 atmospheres, and above, at temperatures above 0° C. The compressibility data I report are, at most, 0.22 percent higher than the 50° C helium data of Wiebe, Gaddy, and Heins; are a

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maximum of 0.065 percent lower than the data of Blancett at 50° C; and are not more than 0.03 percent higher than Johnson's 30° C data.

There are no published high-pressure (500 atm and above) helium data to compare at the -5°, 10°, 20°, 25°, 40°, 60°, 70°, and 80° C isotherms; therefore, data from these isotherms represent new and significant additions to the published literature on PVT properties of helium.

With available equipment and the improved data reduction techniques employed, our experimental data should be of equal or better accuracy than any other published helium data at comparable temperatures and pressures.

ACKNOWLEDGMENT

The author thanks the staff of the Branch of Automatic Data Processing for their valuable aid.

EXPERIMENTAL RESULTS

Twenty-two compressibility runs were made with helium over the temperature range -5° to 80° C, in addition to the 22 runs made at 0° C which were described in an earlier report (4).

The particular cylinder used to supply gas for each of the runs is listed in table 1. Six cylinders of helium were used in this work,

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TABLE 1. - Helium cylinders used to supply sample gas for the compressibility runs

Run No.	Cylinder No.	Lab No.	Run No.	Cylinder No.	Lab No.
HE-(-5)-1	AEC103941	MT-3542	HE-30-3	AEC104016	MT-3182
HE-(-5)-2	AEC103941	MT-3542	HE-40-1	J-256817	MT-3380
HE-10-1	H-1145580	MT-3514	HE-40-2	J-256817	MT-3380
HE-10-2	H-1145580	MT-3514	HE-50-1	J-193477	MT-3713
HE-20-1	J-256817	MT-3380	HE-50-2	J-193477	MT-3713
HE-20-2	J-256817	MT-3380	HE-60-1	J-193477	MT-3713
HE-25-1	H-1145580	MT-3514	HE-60-2	J-193477	MT-3713
HE-25-2	H-1145580	MT-3514	HE-70-1	J-193477	MT-3713
HE-25-3	H-1145580	MT-3514	HE-70-2	J-193477	MT-3713
HE-30-1	AEC104016	MT-3182	HE-80-1	154063	MT-3614
HE-30-2	AEC104016	MT-3182	HE-80-2	154063	MT-3614

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Run No.	Cylinder No.	Lab No.	Run No.	Cylinder No.	Lab No.
HE-(-5)-1	AEC10394A	MT-3342	HE-30-3	AEC10A016	MT-3182
HE-(-5)-2	AEC10394A	MT-3342	HE-40-1	J-25681Y	MT-3380
HE-10-1	H-114538O	MT-3314	HE-40-2	J-25681Y	MT-3380
HE-10-2	H-114538O	MT-3314	HE-50-1	J-1934YY	MT-3713
HE-20-1	J-25681Y	MT-3380	HE-50-2	J-1934YY	MT-3713
HE-20-2	J-25681Y	MT-3380	HE-60-1	J-1934YY	MT-3713
HE-25-1	H-114538O	MT-3314	HE-60-2	J-1934YY	MT-3713
HE-25-2	H-114538O	MT-3314	HE-70-1	J-1934YY	MT-3713
HE-25-3	H-114538O	MT-3314	HE-70-2	J-1934YY	MT-3713
HE-30-1	AEC10A016	MT-3182	HE-80-1	15A053	MT-3614
HE-30-2	AEC10A016	MT-3182	HE-80-2	15A053	MT-3614

and composition analyses of the helium in these cylinders are recorded in table 2.[3/]

3/ All composition analyses were performed by the Branch of Laboratory Services, Helium Research Center, Bureau of Mines, Amarillo, Tex.

All bath temperatures were measured with a Leeds & Northrup[4/]

4/ Identification of manufacturers does not constitute Bureau of Mines endorsement.

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platinum resistance thermometer, serial No. 1586182 and a Leeds & Northrup G-2 Mueller bridge, serial No. 1603629. Temperatures are recorded in table 3 and are the average bath temperatures for a complete run. Reported temperatures are in terms of the 1948 International Practical Temperature Scale (1948 IPTS). Also, bath temperatures are listed in terms of the Thermodynamic Temperature Scale (TTS). Corrections to convert from the 1948 IPTS to the TTS are based upon the work of Preston-Thomas and Kirby (9).

Experimental pressures were measured with a Ruska Instrument Corporation piston gage, serial No. 9274 and a Henry J. Green Instruments, Inc. barometer, serial No. 13346. Experimental pressures for the -5° to 80° C runs are listed in table 4.

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Experimental pressures were measured with a Ruska Instrument Corporation piston gage, serial No. 3214 and a Henry J. Green Instruments, Inc. barometer, serial No. 13346. Experimental pressures for the -5° to 80° C runs are listed in table 4.

[4] Identification of manufacturers does not constitute Bureau of Mines endorsement.

TABLE 2. - Helium impurity analyses, parts per million mole fraction impurities in helium

Cylinder No.	Lab No.	H_2	CH_4	H_2O	Ne	N_2	O_2	Ar	CO_2	Total
154063	MT-3614	0.1	0.0	0.8	7.8	1.4	0.3	0.0	0.0	10.4
J-193477	MT-3713	.0	.0	.1	15.3	1.9	.4	.0	.1	17.8
H-1145580	MT-3514	.2	.0	.2	14.4	.7	.2	.0	.0	15.7
AEC103941	MT-3542	.3	.0	.9	11.7	.6	.1	.0	.1	13.7
J-256817	MT-3380	.1	.0	.1	14.1	1.7	.4	Tr.[1/]	Tr.	16.4
AEC104016	MT-3182	.2	.0	.7	8.2	.8	.2	.1	Tr.	10.2

1/ Tr. indicates less than 0.05 ppm.

TABLE 2. - Helium isotopic analyses, parts per million mole fraction isotopic in helium

Cylinder No.	Lab. No.	H_2	CH_4	H_2O	Ne	N_2	O_2	Ar	CO_2	Total
15A063	MT-3414	0.1	0.0	0.3	7.8	1.4	0.3	0.0	0.0	10.4
J-193477	MT-3713	.0	.0	.1	15.3	1.9	.4	.0	.1	17.8
H-116358	MT-3514	.2	.0	.2	14.4	.7	.2	.0	.0	15.7
AEC10394L	MT-3542	.2	.0	.9	11.7	.6	.1	.0	.1	13.7
J-256817	MT-3380	.1	.0	.1	14.1	1.7	.4	Tr. [1/]	Tr.	16.4
AEC10401G	MT-3382	.2	.0	.7	8.2	.8	.2	.1	Tr.	10.2

1/ Tr. indicates less than 0.05 ppm.

TABLE 3. - Compressibility bath temperatures

Run No.	t, °C (1948 IPTS)	t, °C (TTS)
HE-(-5)-1	-4.999±0.001	-4.996
HE-(-5)-2	-5.001 ±.001	-4.998
HE-10-1	10.001 ±.000	9.996
HE-10-2	10.001 ±.000	9.996
HE-20-1	19.998 ±.001	19.989
HE-20-2	19.998 ±.001	19.989
HE-25-1	25.001 ±.001	24.991
HE-25-2	25.000 ±.000	24.990
HE-25-3	24.999 ±.000	24.989
HE-30-1	30.000 ±.001	29.988
HE-30-2	30.000 ±.001	29.988
HE-30-3	29.998 ±.001	29.986
HE-40-1	40.001 ±.001	39.987
HE-40-2	40.001 ±.001	39.987
HE-50-1	50.002 ±.001	49.987
HE-50-2	49.999 ±.000	49.984
HE-60-1	60.001 ±.001	59.986
HE-60-2	60.001 ±.001	59.986
HE-70-1	70.000 ±.001	69.986
HE-70-2	70.000 ±.002	69.986
HE-80-1	80.000 ±.001	79.988
HE-80-2	80.000 ±.002	79.988

TABLE 3. - Compressibility bath temperatures

Run No.	t, °C (1968 IPTS)	t, °C (ITS)
HE-(-5)-1	-4.999±0.001	-4.996
HE-(-5)-2	-5.001 ±.001	-4.998
HE-10-1	10.001 ±.000	9.996
HE-10-2	10.001 ±.000	9.996
HE-20-1	19.998 ±.001	19.989
HE-20-2	19.998 ±.001	19.989
HE-25-1	25.001 ±.001	24.991
HE-25-2	25.000 ±.000	24.990
HE-25-3	24.999 ±.000	24.989
HE-30-1	30.000 ±.001	29.988
HE-30-2	30.000 ±.001	29.988
HE-30-3	29.998 ±.001	29.986
HE-40-1	40.001 ±.001	39.987
HE-40-2	40.001 ±.001	39.987
HE-50-1	50.002 ±.001	49.987
HE-50-2	49.999 ±.000	49.984
HE-60-1	60.001 ±.001	59.986
HE-60-2	60.000 ±.001	59.986
HE-70-1	70.000 ±.001	69.986
HE-70-2	70.000 ±.002	69.986
HE-80-1	80.000 ±.001	79.988
HE-80-2	80.000 ±.002	79.988

TABLE 4. - Experimental pressures

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-(-5)-1		
0	590.4630870601	0.8801422833958	591.3432293435
1	258.1284048384	.8800707388059	259.0084755772
2	120.8431207327	.8799481062589	121.7230688390
3	58.24777428932	.8792000840787	59.12697437340
4	28.30539106937	.8787791047828	29.18417017416
5	13.64014867676	.8784235492152	14.51857222598
6	6.373119431307	.8780822905529	7.251201721860
7	2.750947765049	.8779740762964	3.628921841346
	Run No. HE-(-5)-2		
0	779.0345368978	0.8758392807005	779.9103761785
1	328.9776614829	.8759358287811	329.8535973117
2	151.6679595751	.8757111353262	152.5436707104
3	72.65873749502	.8751452179519	73.53388271297
4	35.28558563503	.8750513652046	36.16063700023
5	17.08207220126	.8746077908484	17.95667999211
6	8.086127169909	.8742381531525	8.960365323062
7	3.608314111480	.8741585455365	4.482472657016
	Run No. HE-10-1		
0	558.7625932760	0.8816780472596	559.6442713232
1	247.4676405316	.8818761703732	248.3495167020
2	116.5287981877	.8815795326025	117.4103777203
3	56.31297057004	.8813340422781	57.19430461232
4	27.38882353138	.8806083151049	28.26943184649
5	13.19305970830	.8803262136392	14.07338592194
6	6.151641582148	.8798765827624	7.031518164911
7	2.640068596277	.8795209970590	3.519589593336

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-10-2		
0	793.6864553490	0.8809539571457	794.5674093062
1	337.2881711444	.8810131782778	338.1691843226
2	155.9320424279	.8807228615543	156.8127652894
3	74.80552441841	.8800543824591	75.68557880087
4	36.36040434007	.8796189812784	37.24002332134
5	17.61874207074	.8791325049428	18.49787457569
6	8.352673725402	.8789873928302	9.231661118232
7	3.739547628595	.8786460597913	4.618193688387
	Run No. HE-20-1		
0	598.3267888413	0.8794097145426	599.2061985559
1	264.2552079274	.8799294946534	265.1351374221
2	124.2929274482	.8799970452857	125.1729244934
3	60.05664250894	.8790890639142	60.93573157286
4	29.23114981574	.8788355712745	30.10998538701
5	14.10958499072	.8780955211823	14.98768051190
6	6.611123594834	.8773329828540	7.488456577688
7	2.871232963902	.8773841438275	3.748617107729
	Run No. HE-20-2		
0	786.2654035183	0.8713594797268	787.1367629980
1	336.3834729916	.8706574325170	337.2541304241
2	155.9844734034	.8706291220658	156.8551025255
3	74.94433872204	.8704558441024	75.81479456614
4	36.46258562925	.8690399011485	37.33162553040
5	17.68352007141	.8681614174786	18.55168148889
6	8.394782560071	.8673111897899	9.262093749861
7	3.769110414990	.8669700846318	4.636080499621

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. 18, M-1		
0	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]
	Run No. 19, M-1		
0	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]
	Run No. 20, M-2		
0	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-25-1		
0	566.2568344260	0.8738111137700	567.1306455397
1	252.0204388382	.8737400694881	252.8941789077
2	118.9467877876	.8735153616945	119.8203031493
3	57.55509818899	.8732394386498	58.42833762764
4	28.02108384068	.8728042822604	28.89388812294
5	13.51620439353	.8721074737249	14.38831186725
6	6.318399734776	.8709811138101	7.189380848586
7	2.728251652489	.8709015308061	3.599153183295
	Run No. HE-25-2		
0	794.2529613948	0.8762634573872	795.1292248522
1	340.2310704470	.8764908416644	341.1075612887
2	157.8576032933	.8761494785298	158.7337527719
3	75.86371177320	.8754810200135	76.73919279322
4	36.91340382160	.8750600359184	37.78846385752
5	17.90319648831	.8741157426022	18.77731223091
6	8.499666396978	.8732881413967	9.372954538375
7	3.816205912988	.8732085303396	4.689414443328
	Run No. HE-25-3		
0	681.3399694661	0.8774161223872	682.2173855885
1	297.3077114593	.8775125567131	298.1852240160
2	139.0885756886	.8772508120314	139.9658265006
3	67.06959003174	.8762919556297	67.94588198737
4	32.65012698974	.8760159786762	33.52614296841
5	15.80086555457	.8754498158962	16.67631537046
6	7.453398385992	.8749775871740	8.328389761953
7	3.293700822908	.8745053736996	4.168206196608

TABLE 6. - Experimental pressures, continued

R	Case pressure, atm	Gaugemeter pressure, atm	Absolute pressure, atm
Run No. 16-25-1			
0	5[illegible],256234260	0.8732811171700	5[illegible].1206452797
1	232.02[illegible]3881[illegible]	.8717[illegible]0[illegible]6[illegible]1	232.[illegible]4178907[illegible]7
2	118.9[illegible]5[illegible]7[illegible]8[illegible]4	.8[illegible]1[illegible]3[illegible]3[illegible]6[illegible]5	11[illegible].8[illegible]3[illegible]0[illegible]2[illegible]3[illegible]9
3	37.[illegible]5[illegible]0[illegible]0[illegible]1[illegible]8[illegible]9[illegible]9	.8[illegible]1[illegible]7[illegible]6[illegible]3[illegible]4[illegible]0	3[illegible].4[illegible]2[illegible]3[illegible]7[illegible]5[illegible]2[illegible]7[illegible]6[illegible]4
4	28.0[illegible]2[illegible]0[illegible]8[illegible]3[illegible]4[illegible]0[illegible]6[illegible]	.8[illegible]7[illegible]6[illegible]0[illegible]4[illegible]2[illegible]7[illegible]3[illegible]0[illegible]4	2[illegible].8[illegible]0[illegible]4[illegible]7[illegible]2[illegible]7[illegible]4
5	13.[illegible]2[illegible]0[illegible]8[illegible]3[illegible]4[illegible]5	.8[illegible]7[illegible]0[illegible]7[illegible]4[illegible]2[illegible]4[illegible]5	1[illegible].3[illegible]8[illegible]3[illegible]1[illegible]8[illegible]7[illegible]2[illegible]5
6	6.3[illegible]8[illegible]9[illegible]2[illegible]4[illegible]7[illegible]6	.8[illegible]0[illegible]8[illegible]1[illegible]1[illegible]3[illegible]4[illegible]0[illegible]1	7.1[illegible]7[illegible]1[illegible]8[illegible]0[illegible]4[illegible]8[illegible]5[illegible]6
7	2.7[illegible]2[illegible]3[illegible]1[illegible]6[illegible]5[illegible]4[illegible]4[illegible]	.8[illegible]0[illegible]0[illegible]1[illegible]3[illegible]0[illegible]8[illegible]4[illegible]1	3.5[illegible]0[illegible]3[illegible]1[illegible]6[illegible]2[illegible]5[illegible]5
Run No. 16-25-2			
0	7[illegible]4.[illegible]5[illegible]7[illegible]0[illegible]1[illegible]3[illegible]4[illegible]6	0.8[illegible]7[illegible]2[illegible]0[illegible]3[illegible]7[illegible]3[illegible]6[illegible]7[illegible]2	7[illegible]4.1[illegible]4[illegible]2[illegible]6[illegible]5[illegible]7[illegible]2
1	340.2[illegible]1[illegible]0[illegible]0[illegible]4[illegible]7[illegible]0	.8[illegible]7[illegible]0[illegible]5[illegible]0[illegible]6[illegible]1[illegible]8[illegible]5[illegible]	33[illegible].1[illegible]7[illegible]5[illegible]1[illegible]2[illegible]8[illegible]7
2	1[illegible]7.8[illegible]5[illegible]7[illegible]0[illegible]2[illegible]4[illegible]	.8[illegible]7[illegible]1[illegible]0[illegible]4[illegible]8[illegible]5[illegible]4	13[illegible].7[illegible]1[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9
3	2[illegible].9[illegible]4[illegible]1[illegible]7[illegible]1[illegible]2[illegible]4[illegible]	.8[illegible]7[illegible]1[illegible]0[illegible]4[illegible]8[illegible]5[illegible]4	3[illegible].4[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9
4	2[illegible].8[illegible]1[illegible]7[illegible]0[illegible]2[illegible]4[illegible]	.8[illegible]7[illegible]0[illegible]1[illegible]4[illegible]8[illegible]5[illegible]4	3[illegible].4[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9
5	17.9[illegible]1[illegible]7[illegible]0[illegible]2[illegible]4[illegible]	.8[illegible]7[illegible]0[illegible]1[illegible]4[illegible]8[illegible]5[illegible]4	16.7[illegible]7[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9
6	8.4[illegible]9[illegible]0[illegible]1[illegible]4[illegible]7[illegible]5	.8[illegible]7[illegible]1[illegible]1[illegible]4[illegible]8[illegible]5[illegible]4	9.[illegible]7[illegible]2[illegible]9[illegible]4[illegible]2[illegible]1[illegible]7[illegible]5
7	3.8[illegible]5[illegible]2[illegible]9[illegible].[illegible]2[illegible]8[illegible]	.8[illegible]7[illegible]2[illegible]0[illegible]4[illegible]7[illegible]9[illegible]	4.[illegible]6[illegible]9[illegible]1[illegible]4[illegible]4[illegible]3[illegible]2[illegible]8
Run No. 16-25-3			
0	8[illegible].3[illegible]9[illegible]0[illegible]4[illegible]0[illegible]7	0.8[illegible]7[illegible]1[illegible]4[illegible]1[illegible]2[illegible]3[illegible]8[illegible]2	4[illegible]2.[illegible]2[illegible]7[illegible]1[illegible]4[illegible]8[illegible]5[illegible]8[illegible]5
1	2[illegible].3[illegible]0[illegible]7[illegible]1[illegible]4[illegible]3[illegible]	.8[illegible]7[illegible]1[illegible]4[illegible]5[illegible]6[illegible]7[illegible]3[illegible]1	2[illegible].1[illegible]4[illegible]7[illegible]1[illegible]4[illegible]8[illegible]5[illegible]0[illegible]
2	13[illegible].0[illegible]8[illegible]5[illegible]1[illegible]4[illegible]0[illegible]6[illegible]	.8[illegible]7[illegible]1[illegible]2[illegible]4[illegible]8[illegible]5[illegible]1[illegible]4[illegible]	13[illegible].9[illegible]4[illegible]7[illegible]1[illegible]4[illegible]8[illegible]5[illegible]0[illegible]
3	6[illegible].7[illegible]0[illegible]9[illegible]1[illegible]4[illegible]0[illegible]7[illegible]4	.8[illegible]7[illegible]2[illegible]7[illegible]4[illegible]8[illegible]5[illegible]3[illegible]9[illegible]4	6[illegible].4[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]7[illegible]
4	3[illegible].8[illegible]0[illegible]1[illegible]4[illegible]0[illegible]7[illegible]	.8[illegible]7[illegible]0[illegible]1[illegible]4[illegible]8[illegible]5[illegible]7[illegible]4	3[illegible].4[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9[illegible]
5	15.8[illegible]0[illegible]8[illegible]5[illegible]1[illegible]4[illegible]0[illegible]7[illegible]2	.8[illegible]7[illegible]0[illegible]1[illegible]4[illegible]8[illegible]5[illegible]4[illegible]	16.8[illegible]7[illegible]2[illegible]7[illegible]2[illegible]7[illegible]1[illegible]9[illegible]
6	7.[illegible]3[illegible]1[illegible]7[illegible]2[illegible]4[illegible]0[illegible]7[illegible]2	.8[illegible]7[illegible]1[illegible]4[illegible]7[illegible]8[illegible]5[illegible]4[illegible]	8.[illegible]3[illegible]2[illegible]8[illegible]7[illegible]2[illegible]1[illegible]9[illegible]1
7	3.[illegible]7[illegible]0[illegible]8[illegible]2[illegible]0[illegible]8	.8[illegible]7[illegible]0[illegible]2[illegible]7[illegible]8[illegible]9[illegible]6	4.1[illegible]8[illegible]2[illegible]0[illegible]6[illegible]1[illegible]5[illegible]0[illegible]0[illegible]8

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-30-1		
0	376.5088699671	0.8726827845968	377.3815527517
1	173.7101404117	.8728453291095	174.5829857408
2	83.28837232785	.8725266388229	84.16089896667
3	40.51283783587	.8711834221154	41.38402125799
4	19.67908095413	.8705234193295	20.54960437346
5	9.383569842577	.8701394989171	10.25370934149
6	4.259265266717	.8701111951375	5.129376461855
7	--------	--------	--------
	Run No. HE-30-2		
0	678.1217514008	0.8766424703249	678.9983938711
1	296.6767041515	.8773993813843	297.5541035329
2	138.9558844976	.8773565738723	139.8332410715
3	67.04074773865	.8761869425384	67.91693468119
4	32.64429478904	.8756206648540	33.51991545390
5	15.79940861848	.8753304290374	16.67473904752
6	7.453341680222	.8748296737253	8.328171353948
7	3.293205437894	.8751426233736	4.168348061268
	Run No. HE-30-3		
0	778.2329986842	0.8743402722287	779.1073389564
1	335.0543780017	.8737826949984	335.9281606967
2	155.8078608818	.8730715425510	156.6809324244
3	74.95703055161	.8715240925901	75.82855464420
4	36.48977162309	.8705797780707	37.36035140117
5	17.70045061736	.8695046756015	18.56995529297
6	8.403244853807	.8689530213252	9.272197875132
7	3.771094575459	.8687939237509	4.639888499210

TABLE 4. - Experimental measurements, continued

R	Cage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
Run No. RE-10-1			
0	378.5084994271	0.8171862[illegible]5968	377.7815522757
1	171.7101404117	[illegible]	174.[illegible]5
2	83.2883[illegible]2783	[illegible]	84.1[illegible]
3	40.5125178397	[illegible]	41.[illegible]59
4	19.8720805423	[illegible]	20.[illegible]5
5	9.3[illegible]2577	[illegible]	10.2[illegible]9
6	4.[illegible]7	[illegible]	3.[illegible]35
7	[illegible]	[illegible]	[illegible]
Run No. RE-10-2			
0	478.7217514008	0.8[illegible]249	478.9088[illegible]271
1	234.8767041513	[illegible]	237.[illegible]329
2	128.9558842976	[illegible]	129.8[illegible]715
3	[illegible]	[illegible]	[illegible]
4	12.6[illegible]	[illegible]840	13.5[illegible]90
5	15.7[illegible]4	[illegible]274	15.6[illegible]752
6	7.4[illegible]22	[illegible]	8.1[illegible]5
7	3.2[illegible]4	[illegible]	4.1[illegible]68
Run No. RE-10-3			
0	278.2[illegible]5	0.8[illegible]	279.1073[illegible]04
1	135.0[illegible]7	[illegible]	135.9291[illegible]07
2	155.80[illegible]	[illegible]	136.0[illegible]4
3	74.9[illegible]	[illegible]	75.8[illegible]20
4	36.4[illegible]07	[illegible]	37.3[illegible]17
5	17.7[illegible]	[illegible]	18.3[illegible]97
6	8.[illegible]07	[illegible]	9.2[illegible]32
7	4.7[illegible]59	[illegible]	5.1[illegible]10

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-40-1		
0	567.8502478602	0.8829564632862	568.7332043235
1	254.1122158311	.8829724756106	254.9951883067
2	120.2377281400	.8826165780069	121.1203447180
3	58.25392839844	.8817739870989	59.13570238554
4	28.38061740788	.8809458285246	29.26156323641
5	13.69594681030	.8802117997962	14.57615861009
6	6.404806224724	.8804080827695	7.285214307493
7	2.766295453650	.8805389380851	3.646834391735
	Run No. HE-40-2		
0	809.3477186661	0.8737026219214	810.2214212881
1	348.4719888627	.8735803276331	349.3455691903
2	162.0557008044	.8731962432708	162.9288970477
3	77.97940442757	.8718392363178	78.85124366389
4	37.97803765376	.8714553350110	38.84949298877
5	18.44020630970	.8703517074490	19.31055801715
6	8.770907718549	.8699962425979	9.640903961147
7	3.954991419148	.8694586490053	4.824450068153
	Run No. HE-50-1		
0	604.0847945301	0.8710275697590	604.9558220998
1	269.6941659614	.8707887156252	270.5649546770
2	127.4870593906	.8704331419325	128.3574925326
3	61.75742628618	.8698299454743	62.62725623165
4	30.10966200093	.8692922164086	30.97895421734
5	14.55942080405	.8688571378429	15.42827794189
6	6.841555477882	.8680435680678	7.709599045950
7	2.992105250522	.8674777054636	3.859582955986

TABLE 6. - Experimental Pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HP-60-1		
0	567.85524[illegible]-02	0.8[illegible]5[illegible]6[illegible]2	568.71[illegible]1215
1	254.1[illegible]8311	[illegible]	254.9[illegible]8[illegible]057
2	120.2[illegible]1[illegible]0	[illegible]	121.12[illegible]4[illegible]150
3	58.2[illegible]5[illegible]	[illegible]	59.1[illegible]0[illegible]5[illegible]
4	28.3[illegible]0[illegible]8	[illegible]	29.2[illegible]5[illegible]2[illegible]1
5	15.[illegible]0[illegible]0	[illegible]	16.5[illegible]1[illegible]009
6	8.[illegible]2[illegible]24	[illegible]	7.2[illegible]2[illegible]4[illegible]25
7	4.7[illegible]5[illegible]30	[illegible]	3.6[illegible]6[illegible]9[illegible]235
	Run No. HP-60-2		
0	809.34[illegible]	0.8[illegible]2[illegible]6	810.22[illegible]2[illegible]1
1	348.4[illegible]	[illegible]	349.3[illegible]2[illegible]3
2	102.0[illegible]0	[illegible]	182.9[illegible]8[illegible]0[illegible]27
3	[illegible]	[illegible]	[illegible]
4	37.8[illegible]	[illegible]	38.8[illegible]2[illegible]8[illegible]77
5	18.4[illegible]0	[illegible]	19.3[illegible]8[illegible]715
6	8.1[illegible]7	[illegible]	9.4[illegible]0[illegible]3[illegible]1[illegible]47
7	3.9[illegible]	[illegible]	4.8[illegible]4[illegible]3[illegible]0[illegible]8[illegible]53
	Run No. HP-30-1		
0	[illegible]	0.8[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]
2	127.4[illegible]	[illegible]	128.[illegible]
3	61.7[illegible]	[illegible]	62.[illegible]2[illegible]165
4	30.1[illegible]	[illegible]	30.9[illegible]2[illegible]124
5	14.5[illegible]	[illegible]	15.4[illegible]2[illegible]189
6	6.[illegible]	[illegible]	7.7[illegible]0[illegible]950
7	2.9[illegible]	[illegible]	3.6[illegible]2[illegible]5[illegible]8

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-50-2		
0	784.0290723375	0.8654589413921	784.8945312789
1	340.3994429350	.8655658881134	341.2650088231
2	158.9000380252	.8652992153274	159.7653372405
3	76.59187739337	.8651120778569	77.45698947123
4	37.32926565837	.8648876644089	38.19415332278
5	18.12685613088	.8647054449029	18.99156157578
6	8.618344488798	.8648363002184	9.483180789017
7	3.880590647550	.8647708725606	4.745361520111
	Run No. HE-60-1		
0	612.7990115267	0.8831511694122	613.6821626961
1	274.1653115167	.8829260798085	275.0482375965
2	129.7223678706	.8824104932338	130.6047783638
3	62.86951066355	.8818438674545	63.75135453100
4	30.65954196636	.8813427396109	31.54088470597
5	14.82888665478	.8803038206342	15.70919047542
6	6.970801635097	.8796208180901	7.850435349170
7	3.050871113733	.8790544350498	3.929925548783
	Run No. HE-60-2		
0	797.2750466573	0.8743433130782	798.1493899704
1	346.9511120291	.8743518605828	347.8254638897
2	162.1278977570	.8736181991136	163.0015159561
3	78.18744311473	.8728703708311	79.06031348556
4	38.12074134900	.8719263907150	38.99266773972
5	18.51975195396	.8709453906663	19.39069734463
6	8.812355228911	.8702825820247	9.682637810936
7	3.974622147844	.8699042988188	4.844526446663

TABLE 4. - Experimental pressures, continued

R	Cage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-50-2		
0	784.0290723775	0.2943129021	784.8947312789
1	340.3994429730	.9035363471	341.2959088291
2	158.9000380232	.8432952136	159.7532872405
3	76.3918277327	.8811207785	77.2730984723
4	37.3292056317	.8165760489	38.1458222278
5	18.1268591349	.8427094429	18.9915615278
6	8.6183444857	.8843960218	9.4531807017
7	3.8805900475	.8427709725	4.7233615011
	Run No. HE-60-1		
0	812.7790112567	0.1831511496	813.6621629963
1	274.1631215467	.8222480780	275.0482372965
2	129.7223578706	.8535409972	130.6057788638
3	62.8603[illegible]	.8[illegible]	63.7513[illegible]
4	30.6595[illegible]	.8[illegible]	31.5408[illegible]
5	14.8288846728	.8392308062	15.7051908742
6	6.9708016390[illegible]	.8[illegible]	7.8506[illegible]
7	3.0508711137[illegible]	[illegible]	3.9[illegible]
	Run No. HE-60-2		
0	797.2750684573	0.8746341030[illegible]	798.1497889704
1	346.9511120191	.8742[illegible]	347.8254688897
2	162.1274977370	.8746[illegible]	163.0015395061
3	78.1874631173	.8[illegible]	79.0601103835
4	38.1207413402	.8[illegible]	38.9926617972
5	18.5197519596	.8[illegible]	19.3906972483
6	8.8123155289[illegible]	.8[illegible]	9.6832637810936
7	3.9724621467[illegible]	.8[illegible]	4.8443260466[illegible]

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. HE-70-1		
0	577.9849569346	0.8765277604038	578.8614846950
1	260.8375005491	.8764565048996	261.7139570540
2	123.9061597636	.8763483430443	124.7825081067
3	60.15321438864	.8755349198795	61.02874930852
4	29.34798087660	.8749974088180	30.22297828542
5	14.18612327873	.8741840685792	15.06030734731
6	6.654185778351	.8737546269125	7.527940405264
7	2.895543359368	.8735213919652	3.769064751333
	Run No. HE-70-2		
0	761.5135854882	0.8748495539711	762.3884350421
1	334.4317549365	.8753444336540	335.3077180689
2	156.9292411290	.8750173538758	157.8042584829
3	75.81991550909	.8744655903062	76.69438109940
4	36.98785130612	.8746333908837	37.86248469700
5	17.96284464965	.8748296259869	18.83767427564
6	8.533859246180	.8747499922293	9.408609238410
7	3.833748994423	.8748011800960	4.708550174519
	Run No. HE-80-1		
0	587.6594478851	0.8747756094271	588.5342234945
1	265.6296536725	.8751254550652	266.5047791276
2	126.2790321990	.8751539136416	127.1541861126
3	61.33509384763	.8742522307213	62.20934607835
4	29.93839265419	.8736776353749	30.81207028956
5	14.48095495705	.8736122119728	15.35456716902
6	6.801720133839	.8734813651686	7.675201499008
7	2.969207495209	.8735467885707	3.842754283780

TABLE 4. - Experimental Procedure, continued

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
		Run No. HE-80-2	
0	765.6569981422	0.8880852239360	766.5450833661
1	373.3150581081	.8880631187296	338.2031212268
2	158.5058848004	.8876628593495	159.3935476598
3	76.63104006621	.8861579253299	77.51719799154
4	37.39875906931	.8853007616790	38.28405983099
5	18.16512478543	.8846177272398	19.04974251267
6	8.631156750678	.8841964261314	9.515353176809
7	3.878360118642	.8838772494326	4.762237368074

TABLE 4. - Experimental pressures, continued

R	Gage pressure, atm	Barometric pressure, atm	Absolute pressure, atm
	Run No. PE-EU-2		
0	755.65039[illegible]1272	0.[illegible]0822[illegible]0	7[illegible].5[illegible]1
1	3[illegible].2[illegible]0	[illegible]1[illegible] 29[illegible]	3[illegible].[illegible]1[illegible]
2	1[illegible].5[illegible]8[illegible]	[illegible]7[illegible]2[illegible]3	1[illegible].3[illegible]7[illegible]
3	7[illegible].[illegible]1[illegible]	[illegible]3[illegible]1[illegible]2[illegible]	7[illegible].[illegible]1[illegible]7[illegible]1[illegible]
4	3[illegible].[illegible]7[illegible]	[illegible]8[illegible]1[illegible]2[illegible]	3[illegible].[illegible]8[illegible]5[illegible]
5	1[illegible].1[illegible]1[illegible]	[illegible]0[illegible]1[illegible]2[illegible]	1[illegible].[illegible]0[illegible]7[illegible]2[illegible]1[illegible]
6	8.[illegible]1[illegible]7[illegible]2[illegible]	[illegible]1[illegible]4[illegible]	9.[illegible]1[illegible]3[illegible]1[illegible]7[illegible]2[illegible]
7	3.[illegible]1[illegible]1[illegible]2	[illegible]3[illegible]7[illegible]4[illegible]1[illegible]	4.[illegible]2[illegible]3[illegible]7[illegible]3[illegible]2[illegible]

Pressures were fitted to an equation of the form;

$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4 = Z_O P_O^{-1} f_r N^r P_r \quad , \qquad (1)$$

where

Z_r = compressibility factor at P_r,

B, C, D, and E = parameters evaluated from the experimental pressures,

P_r = pressure after the r th expansion,

P_O = pressure before the first expansion,

Z_O = compressibility factor at P_O,

r = R = expansion number,

f_r = factor to correct for elastic pressure distortion, and

N = isothermal zero pressure volume ratio.

Data reduction methods described by Barieau and Dalton (1, 2) were used in the data treatment. All data for a particular isotherm were treated simultaneously and a weighting factor of $P_r^{-3/4}$ was used. This weighting factor was assumed to be applicable at all temperatures of this work and is derived from multiple measurements made at 0° C (4). Distortion coefficients determined by Briggs and Barieau (5) were used in the data treatment.

Observed pressures, calculated pressures, difference between observed and calculated pressures, parameters, variances, covariances, and standard errors are listed in table 5.

Pressures were fitted to an equation of the form:

$$Z_i = 1 + BP_i + CP_i^2 + DP_i^3 + EP_i^4 - Z_0 P_0^{-1} P_i W^r P_i \quad . \qquad (1)$$

where

Z_i = compressibility factor at P_i,

B, C, D, and E = parameters evaluated from the experimental pressures;

P_i = pressure after the r th expansion,

P_0 = pressure before the first expansion,

Z_0 = compressibility factor at P_0,

r = E = expansion number,

P_i = factor to correct for elastic pressure distortion, and

W = instrumental zero pressure volume ratio.

Data reduction methods described by Barieau and Dalton (1, 2) were used in the data treatment. All data for a particular isotherm were treated simultaneously and a weight factor of P_i^{-2} was used. This weighting factor was assumed to be applicable at all temperatures of this work and is derived from multiple measurements made at 0° C (4). Distortion coefficients determined by Briggs and Barieau (3) were used in the data treatment.

Observed pressures, calculated pressures, difference between observed and calculated pressures, parameters, variances, covariances, and standard errors are listed in table 3.

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES

-5 DEGREE C HELIUM ISOTHERM, 268.153 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-(-5)-1		
0	5.9134322E+02	5.9134322E+02	0.00000E-99	0.00000E-99
1	2.5900847E+02	2.5900838E+02	8.71472E-05	3.36464E-07
2	1.2172306E+02	1.2172216E+02	9.00190E-04	7.39539E-06
3	5.9126974E+01	5.9126973E+01	1.15529E-06	1.95391E-08
4	2.9184170E+01	2.9184624E+01	-4.53993E-04	-1.55561E-05
5	1.4518572E+01	1.4519325E+01	-7.53637E-04	-5.19085E-05
6	7.2512017E-00	7.2517024E-00	-5.00716E-04	-6.90528E-05
7	3.6289218E-00	3.6289632E-00	-4.13888E-05	-1.14052E-05
		RUN NO. HE-(-5)-2		
0	7.7991037E+02	7.7991037E+02	0.00000E-99	0.00000E-99
1	3.2985359E+02	3.2985351E+02	8.02925E-05	2.43418E-07
2	1.5254367E+02	1.5254469E+02	-1.02422E-03	-6.71433E-06
3	7.3533882E+01	7.3533745E+01	1.37686E-04	1.87242E-06
4	3.6160637E+01	3.6160199E+01	4.37694E-04	1.21041E-05
5	1.7956679E+01	1.7956415E+01	2.64975E-04	1.47563E-05
6	8.9603653E-00	8.9601030E-00	2.62316E-04	2.92751E-05
7	4.4824726E-00	4.4818327E-00	6.39944E-04	1.42765E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 3.64668E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994372006E-00	S2N	1.57443E-09	SN	3.96791E-05
B	5.450581140E-04	S2B	8.20482E-13	SB	9.05805E-07
C	-6.880542866E-08	S2C	1.02912E-17	SC	3.20799E-09
D	2.368831629E-11	S2D	2.77343E-23	SD	5.26634E-12
E	-7.353996263E-15	S2E	8.87702E-30	SE	2.97943E-15

COVARIANCES

S2BC	-2.85908E-15	S2BD	4.59480E-18	S2BE	-2.55141E-21
S2BN	-3.38067E-11	S2CD	-1.68156E-20	S2CE	9.43404E-24
S2CN	1.11277E-13	S2DE	-1.56566E-26	S2DN	-1.74267E-16
S2EN	9.53317E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES

-5 DEGREE C HELIUM ISOTHERM, 268.153 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-(-5)-1		
0	5.91343225E+02	5.91343225E+02	0.00000E-99	0.00000E-99
1	2.59008476E+02	2.59008386E+02	8.71476E-05	3.36466E-07
2	1.21723066E+02	1.21722166E+02	9.00190E-04	7.39539E-06
3	5.91246974E+01	5.91246912E+01	1.15529E-06	1.95391E-08
4	2.91841706E+01	2.91844674E+01	-4.53993E-04	-1.55861E-05
5	1.45185726E+01	1.45192546E+01	-7.53637E-04	-5.19085E-05
6	7.25120176E-00	7.25170246E-00	-5.00716E-04	-6.90528E-05
7	3.62892186E-00	3.62896326E-00	-4.13838E-05	-1.14052E-05
		RUN NO. HE-(-5)-2		
0	7.79910376E+02	7.79910376E+02	0.00000E-99	0.00000E-99
1	3.29853596E+02	3.29853516E+02	8.02925E-05	2.43418E-07
2	1.52544676E+02	1.52544696E+02	-1.02422E-03	-6.71433E-06
3	7.35388276E+01	7.35387469E+01	1.37686E-04	1.87424E-06
4	3.61606376E+01	3.61601906E+01	4.37694E-04	1.21041E-05
5	1.79566796E+01	1.79566156E+01	2.64975E-04	1.47563E-05
6	8.96034656E-00	8.96010406E-00	2.42410E-04	2.70749E-05
7	4.48246726E-00	4.48193276E-00	5.39944E-04	1.42765E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 3.64668E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.99437200 6E-00	S2N	1.57443E-09	SN	3.95791E-05
B	5.49058114 0E-04	S2B	8.20482E-13	SB	9.05805E-07
C	-6.88054286 6E-08	S2C	1.02912E-17	SC	3.20799E-09
D	2.36883162 9E-11	S2D	2.71343E-23	SD	5.26034E-12
E	-7.35399626 3E-15	S2E	8.47702E-30	SE	2.97943E-15

COVARIANCES

S2BC	-2.85908E-15	S2BD	4.59480E-18	S2BE	-2.55141E-21
S2BN	-3.38067E-11	S2CD	-1.68156E-20	S2CE	9.43404E-24
S2CN	1.11277E-13	S2DE	-1.56566E-26	S2DN	-1.74267E-16
S2EN	9.53317E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

10 DEGREE C HELIUM ISOTHERM, 283.146 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-10-1		
0	5.5964427E+02	5.5964427E+02	0.00000E-99	0.00000E-99
1	2.4834951E+02	2.4835010E+02	-5.86045E-04	-2.35976E-06
2	1.1741037E+02	1.1740971E+02	6.63982E-04	5.65522E-06
3	5.7194304E+01	5.7193934E+01	3.70396E-04	6.47610E-06
4	2.8269431E+01	2.8269513E+01	-8.14776E-05	-2.88218E-06
5	1.4073385E+01	1.4073642E+01	-2.56113E-04	-1.81983E-05
6	7.0315181E-00	7.0314726E-00	4.54710E-05	6.46675E-06
7	3.5195895E-00	3.5193373E-00	2.52248E-04	7.16697E-05
		RUN NO. HE-10-2		
0	7.9456740E+02	7.9456740E+02	0.00000E-99	0.00000E-99
1	3.3816918E+02	3.3816869E+02	4.86746E-04	1.43935E-06
2	1.5681276E+02	1.5681324E+02	-4.78754E-04	-3.05303E-06
3	7.5685578E+01	7.5685330E+01	2.47967E-04	3.27628E-06
4	3.7240023E+01	3.7240387E+01	-3.64580E-04	-9.79002E-06
5	1.8497874E+01	1.8498172E+01	-2.98239E-04	-1.61229E-05
6	9.2316611E-00	9.2317397E-00	-7.86667E-05	-8.52140E-06
7	4.6181936E-00	4.6180189E-00	1.74746E-04	3.78387E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 9.94806E-08

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994382057E-00	S2N	4.16311E-10	SN	2.04037E-05
B	5.131433977E-04	S2B	2.14664E-13	SB	4.63319E-07
C	-6.241427933E-08	S2C	2.75761E-18	SC	1.66060E-09
D	1.922181361E-11	S2D	7.66173E-24	SD	2.76798E-12
E	-4.941251357E-15	S2E	2.50820E-30	SE	1.58373E-15

COVARIANCES					
S2BC	-7.55758E-16	S2BD	1.22975E-18	S2BE	-6.89270E-22
S2BN	-8.87077E-12	S2CD	-4.57217E-21	S2CE	2.59233E-24
S2CN	2.93865E-14	S2DE	-4.37381E-27	S2DN	-4.64725E-17
S2EN	2.56218E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

10 DEGREE C HELIUM ISOTHERM, 283.146 K (ITS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-10-1		
0	5.596442E+02	5.596442E+02	0.000000E-99	0.000000E-99
1	2.483495E+02	2.483501E+02	-5.886045E-04	-2.359716E-06
2	1.174103E+02	1.174097E+02	6.639225E-04	5.655226E-06
3	5.719430E+01	5.719392E+01	3.703566E-04	6.472610E-06
4	2.826943E+01	2.826951E+01	-8.147746E-05	-2.882142E-06
5	1.407238E+01	1.407364E+01	-2.561137E-04	-1.819836E-05
6	7.031518E-00	7.031472E-00	4.542108E-05	6.466175E-06
7	3.519595E-00	3.519397E-00	2.522486E-04	7.164527E-05
		RUN NO. HE-10-2		
0	7.945674E+02	7.945674E+02	0.000000E-99	0.000000E-99
1	3.301691E+02	3.301686E+02	4.847466E-04	1.469355E-06
2	1.568127E+02	1.568132E+02	-4.187546E-04	-3.053038E-06
3	7.561755E+01	7.558539E+01	2.479617E-04	3.272628E-06
4	3.724002E+01	3.724034E+01	-3.645806E-04	-9.790026E-06
5	1.847148E+01	1.847121E+01	-2.982397E-04	-1.615246E-05
6	9.231661E-00	9.231739E-00	-7.886617E-05	-8.521406E-06
7	4.618193E-00	4.618018E-00	1.747468E-04	3.783872E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 9.948064E-04

PARAMETERS	VARIANCES	STANDARD ERRORS
N 1.994382057E-00	S2N 4.163116E-10	SN 2.040376E-05
B 5.131439772E-04	S2B 2.186644E-13	SB 4.633192E-07
C -0.241527933E-08	S2C 2.757616E-18	SC 1.660605E-09
D 1.922181361E-11	S2D 7.661736E-24	SD 2.767986E-12
E -4.941251357E-15	S2E 2.508206E-30	SE 1.583736E-15

COVARIANCES

S2BC -7.557586E-16	S2BD 1.229795E-18	S2BE -6.892706E-22
S2BN -8.870776E-12	S2CD -4.571376E-21	S2CE 2.592336E-24
S2CN 2.938656E-14	S2DE -4.373816E-27	S2DN -4.667256E-17
S2EN 2.562186E-20		

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

20 DEGREE C HELIUM ISOTHERM, 293.139 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-20-1		
0	5.9920619E+02	5.9920619E+02	0.00000E-99	0.00000E-99
1	2.6513513E+02	2.6513688E+02	-1.74436E-03	-6.57914E-06
2	1.2517292E+02	1.2516971E+02	3.21254E-03	2.56648E-05
3	6.0935731E+01	6.0934205E+01	1.52647E-03	2.50506E-05
4	3.0109985E+01	3.0110481E+01	-4.96514E-04	-1.64900E-05
5	1.4987680E+01	1.4989373E+01	-1.69327E-03	-1.12977E-04
6	7.4884565E-00	7.4893940E-00	-9.37491E-04	-1.25191E-04
7	3.7486171E-00	3.7489353E-00	-3.18217E-04	-8.48893E-05
		RUN NO. HE-20-2		
0	7.8713676E+02	7.8713676E+02	0.00000E-99	0.00000E-99
1	3.3725413E+02	3.3725252E+02	1.60890E-03	4.77060E-06
2	1.5685510E+02	1.5685766E+02	-2.56326E-03	-1.63416E-05
3	7.5814794E+01	7.5814946E+01	-1.52409E-04	-2.01029E-06
4	3.7331625E+01	3.7332241E+01	-6.15671E-04	-1.64919E-05
5	1.8551681E+01	1.8552068E+01	-3.87282E-04	-2.08758E-05
6	9.2620937E-00	9.2614242E-00	6.69506E-04	7.22845E-05
7	4.6360804E-00	4.6339371E-00	2.14339E-03	4.62330E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.81868E-06

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994058615E-00	S2N	1.18975E-08	SN	1.09075E-04
B	4.967625561E-04	S2B	5.93883E-12	SB	2.43697E-06
C	-6.551595319E-08	S2C	7.23602E-17	SC	8.50648E-09
D	2.553666669E-11	S2D	1.89128E-22	SD	1.37524E-11
E	-7.805720998E-15	S2E	5.89592E-29	SE	7.67849E-15

COVARIANCES					
S2BC	-2.03974E-14	S2BD	3.22735E-17	S2BE	-1.76788E-20
S2BN	-2.50067E-10	S2CD	-1.16426E-19	S2CE	6.44469E-23
S2CN	8.11449E-13	S2DE	-1.05360E-25	S2DN	-1.25081E-15
S2EN	6.74864E-19				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

20 DEGREE C HELIUM ISOTHERM, 293.139 K (ITS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-20-1		
0	5.99206E+02	5.99206E+02	0.00000E-00	0.00000E-99
1	2.65135E+02	2.65135E+02	-1.74945E-03	-6.57191E-04
2	1.25172E+02	1.25170E+02	1.21254E-03	2.56458E-05
3	6.09357E+01	6.09342E+01	1.52647E-03	2.50505E-05
4	3.01099E+01	3.01104E+01	-4.52519E-04	-1.66990E-05
5	1.49876E+01	1.49877E+01	-1.43277E-03	-1.12717E-04
6	7.48845E-00	7.48939E-00	-9.45912E-04	-1.25101E-04
7	3.74865E-00	3.74845E-00	1.14217E-04	8.47635E-05
		RUN NO. HE-20-2		
0	7.82136E+02	7.82135E+02	0.00000E-99	0.00000E-99
1	3.37254E+02	3.37252E+02	1.68090E-03	4.77006E-04
2	1.56855E+02	1.56872E+02	-2.76272E-02	-1.76476E-05
3	7.58147E-01	7.58140E-01	1.59209E-04	2.01027E-04
4	3.73316E+01	3.73324E+01	-8.15417E-04	-1.68491E-05
5	1.85516E+01	1.85526E+01	-3.17267E-04	-2.08158E-05
7	4.65608E-00	4.65[illegible]E-00	1.15348E-03	4.65230E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.81686E-06

PARAMETERS	VARIANCES	STANDARD ERRORS
N 1.99409E-00	S2N 1.10175E-00	SN 1.00072E-04
B 4.96725E-04	S2B 5.[illegible]E-12	SB 2.43401E-06
C -6.55195E-08	S2C 7.[illegible]E-17	SC 8.50088E-09
D 2.55346E-11	S2D 1.[illegible]E-22	SD 1.37524E-11
E -7.80572E-15	S2E 5.[illegible]E-29	SE 1.67846E-15

COVARIANCES

S2BC -2.03974E-14	S2BD 3.[illegible]E-17	S2BE -1.16788E-20
S2BN -2.50067E-10	S2CD 1.[illegible]E-19	S2CE 6.44465E-22
S2CN 8.11498E-13	S2DE -1.[illegible]E-25	S2DN -1.25081E-15
S2EN 6.74065E-19		

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

25 DEGREE C HELIUM ISOTHERM, 298.140 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-25-1		
0	5.6713064E+02	5.6713064E+02	0.00000E-99	0.00000E-99
1	2.5289417E+02	2.5289603E+02	-1.85482E-03	-7.33438E-06
2	1.1982030E+02	1.1982049E+02	-1.92888E-04	-1.60981E-06
3	5.8428337E+01	5.8428774E+01	-4.37243E-04	-7.48340E-06
4	2.8893888E+01	2.8894418E+01	-5.29925E-04	-1.83404E-05
5	1.4388311E+01	1.4388316E+01	-4.69438E-06	-3.26263E-07
6	7.1893808E-00	7.1895749E-00	-1.94059E-04	-2.69924E-05
7	3.5991531E-00	3.5986885E-00	4.64654E-04	1.29101E-04
		RUN NO. HE-25-2		
0	7.9512922E+02	7.9512922E+02	0.00000E-99	0.00000E-99
1	3.4110756E+02	3.4110868E+02	-1.12041E-03	-3.28465E-06
2	1.5873375E+02	1.5873355E+02	1.96691E-04	1.23913E-06
3	7.6739192E+01	7.6738273E+01	9.18996E-04	1.19755E-05
4	3.7788463E+01	3.7788516E+01	-5.27782E-05	-1.39667E-06
5	1.8777312E+01	1.8777780E+01	-4.68310E-04	-2.49402E-05
6	9.3729545E-00	9.3730963E-00	-1.41764E-04	-1.51248E-05
7	4.6894144E-00	4.6891805E-00	2.33870E-04	4.98719E-05
		RUN NO. HE-25-3		
0	6.8221738E+02	6.8221738E+02	0.00000E-99	0.00000E-99
1	2.9818522E+02	2.9818409E+02	1.13352E-03	3.80142E-06
2	1.3996582E+02	1.3996441E+02	1.41087E-03	1.00801E-05
3	6.7945881E+01	6.7945484E+01	3.97867E-04	5.85565E-06
4	3.3526142E+01	3.3526582E+01	-4.39504E-04	-1.31093E-05
5	1.6676315E+01	1.6676693E+01	-3.77752E-04	-2.26520E-05
6	8.3283897E-00	8.3284871E-00	-9.73623E-05	-1.16904E-05
7	4.1682061E-00	4.1676250E-00	5.81160E-04	1.39427E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 4.95108E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994384358E-00	S2N	6.01977E-10	SN	2.45352E-05
B	4.845390658E-04	S2B	2.52643E-13	SB	5.02636E-07
C	-5.723159037E-08	S2C	2.76324E-18	SC	1.66230E-09
D	1.703117637E-11	S2D	6.75689E-24	SD	2.59940E-12
E	-4.278992786E-15	S2E	2.01380E-30	SE	1.41908E-15

COVARIANCES					
S2BC	-8.16898E-16	S2BD	1.23701E-18	S2BE	-6.55060E-22
S2BN	-1.14562E-11	S2CD	-4.28908E-21	S2CE	2.30836E-24
S2CN	3.43956E-14	S2DE	-3.67457E-27	S2DN	-5.02238E-17
S2EN	2.60099E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

30 DEGREE C HELIUM ISOTHERM, 303.137 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-30-1		
0	3.7738155E+02	3.7738155E+02	0.00000E-99	0.00000E-99
1	1.7458298E+02	1.7458666E+02	-3.68327E-03	-2.10975E-05
2	8.4160898E+01	8.4164186E+01	-3.28782E-03	-3.90659E-05
3	4.1384021E+01	4.1387478E+01	-3.45743E-03	-8.35452E-05
4	2.0549604E+01	2.0552197E+01	-2.59292E-03	-1.26178E-04
5	1.0253709E+01	1.0255554E+01	-1.84530E-03	-1.79964E-04
6	5.1293764E-00	5.1299649E-00	-5.88537E-04	-1.14738E-04
		RUN NO. HE-30-2		
0	6.7899839E+02	6.7899839E+02	0.00000E-99	0.00000E-99
1	2.9755410E+02	2.9754888E+02	5.21846E-03	1.75378E-05
2	1.3983324E+02	1.3983397E+02	-7.35384E-04	-5.25900E-06
3	6.7916934E+01	6.7918879E+01	-1.94435E-03	-2.86284E-05
4	3.3519915E+01	3.3522145E+01	-2.22971E-03	-6.65190E-05
5	1.6674739E+01	1.6676881E+01	-2.14203E-03	-1.28460E-04
6	8.3281713E-00	8.3293612E-00	-1.18986E-03	-1.42872E-04
7	4.1683480E-00	4.1683578E-00	-9.78725E-06	-2.34799E-06
		RUN NO. HE-30-3		
0	7.7910733E+02	7.7910733E+02	0.00000E-99	0.00000E-99
1	3.3592816E+02	3.3594165E+02	-1.34973E-02	-4.01793E-05
2	1.5668093E+02	1.5667637E+02	4.55289E-03	2.90583E-05
3	7.5828554E+01	7.5821551E+01	7.00322E-03	9.23560E-05
4	3.7360351E+01	3.7355433E+01	4.91830E-03	1.31644E-04
5	1.8569955E+01	1.8567330E+01	2.62528E-03	1.41372E-04
6	9.2721978E-00	9.2694300E-00	2.76784E-03	2.98510E-04
7	4.6398884E-00	4.6377746E-00	2.11387E-03	4.55586E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 1.44764E-05

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994285342E-00	S2N	2.22890E-08	SN	1.49295E-04
B	4.795509798E-04	S2B	9.29399E-12	SB	3.04860E-06
C	-7.001663471E-08	S2C	9.49348E-17	SC	9.74345E-09
D	4.539441138E-11	S2D	2.18909E-22	SD	1.47956E-11
E	-2.409150776E-14	S2E	6.32191E-29	SE	7.95104E-15

COVARIANCES

S2BC	-2.92077E-14	S2BD	4.30851E-17	S2BE	-2.23456E-20
S2BN	-4.28804E-10	S2CD	-1.43005E-19	S2CE	7.53477E-23
S2CN	1.27417E-12	S2DE	-1.16925E-25	S2DN	-1.82793E-15
S2EN	9.31096E-19				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

30 DEGREE C HELIUM ISOTHERM, 303.137 K (ITS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-30-1		
0	3.77381556E+02	3.77381556E+02	0.00000E-99	0.00000E-99
1	1.74582986E+02	1.74586066E+02	-3.08276E-03	-2.16972E-05
2	8.41608986E+01	8.41641866E+01	-3.28122E-03	-3.90559E-05
3	4.13840216E+01	4.13874728E+01	-3.45143E-03	-8.35452E-05
4	2.05469604E+01	2.05512112E+01	-2.59292E-03	-1.26178E-04
5	1.02537096E+01	1.02565554E+01	-1.84536E-03	-1.79964E-04
6	5.12937646E-00	5.12969469E-00	-5.88537E-04	-1.14736E-04
		RUN NO. HE 30-2		
0	6.78998396E+02	6.78998396E+02	0.00000E-99	0.00000E-99
1	2.97554108E+02	2.97548686E+02	5.51846E-03	1.75376E-05
2	1.39832464E+02	1.39843457E+02	-7.53804E-04	-5.25000E-06
3	6.79169346E+01	6.79188796E+01	-1.94452E-03	-2.86264E-05
4	3.35199156E+01	3.35221465E+01	-2.23121E-03	-6.65190E-05
5	1.66174736E+01	1.66182626E+01	-2.14204E-03	-1.28466E-04
6	8.32817138E-00	8.32934125E-00	-1.18986E-02	-1.42812E-04
7	4.16834408E-00	4.16815181E-00	-1.92725E-04	-2.36799E-04
		RUN NO. HE-30-3		
0	7.79107236E+02	7.79107236E+02	0.00000E-99	0.00000E-99
1	3.35928166E+02	3.35941656E+02	-1.34928E-02	-4.01792E-05
2	1.56680936E+02	1.56676212E+02	4.72480E-04	2.90589E-05
3	7.58285546E+01	7.58215516E+01	7.00324E-03	9.23560E-05
4	3.73469316E+01	3.73554326E+01	-8.50430E-03	1.31654E-04
5	1.85699556E+01	1.85672306E+01	2.72498E-03	1.47172E-04
6	9.27219786E-00	9.26943006E-00	2.76168E-03	2.98516E-04
7	4.63988846E-00	4.63777486E-00	2.11398E-03	4.55686E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 1.46726E-05

PARAMETERS	VARIANCES	STANDARD ERRORS
M 1.99428534E-03	S2M 2.22090E-00	SM 1.49299E-04
B 4.79590798E-04	S2B 9.29390E-12	SB 3.04886E-06
C -7.00166434E-08	S2C 9.49364E-17	SC 9.74345E-09
D 4.53944138E-11	S2D 2.18308E-22	SD 1.47956E-11
E -2.40915077E-14	S2E 6.32191E-29	SE 7.95104E-15

COVARIANCES

S2BC -2.92077E-14	S2BD 4.20831E-17	S2BE -2.29456E-20
S2BM -4.28064E-18	S2CD -1.43005E-19	S2CE 7.53477E-23
S2CM 1.27417E-12	S2CE -1.15925E-25	S2DM -1.82793E-15
S2EM 9.31096E-19		

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-40-1		
0	5.6873320E+02	5.6873320E+02	0.00000E-99	0.00000E-99
1	2.5499518E+02	2.5499561E+02	-4.24029E-04	-1.66289E-06
2	1.2112034E+02	1.2111983E+02	5.06850E-04	4.18468E-06
3	5.9135702E+01	5.9134925E+01	7.77044E-04	1.31400E-05
4	2.9261563E+01	2.9262064E+01	-5.01053E-04	-1.71232E-05
5	1.4576158E+01	1.4576407E+01	-2.48980E-04	-1.70813E-05
6	7.2852143E-00	7.2850493E-00	1.64921E-04	2.26378E-05
7	3.6468343E-00	3.6469706E-00	-1.36295E-04	-3.73736E-05
		RUN NO. HE-40-2		
0	8.1022142E+02	8.1022142E+02	0.00000E-99	0.00000E-99
1	3.4934556E+02	3.4934511E+02	4.49525E-04	1.28676E-06
2	1.6292889E+02	1.6292958E+02	-6.83575E-04	-4.19554E-06
3	7.8851243E+01	7.8850787E+01	4.55801E-04	5.78052E-06
4	3.8849492E+01	3.8849895E+01	-4.02917E-04	-1.03712E-05
5	1.9310558E+01	1.9310973E+01	-4.15238E-04	-2.15031E-05
6	9.6409039E-00	9.6409918E-00	-8.78462E-05	-9.11182E-06
7	4.8244500E-00	4.8237992E-00	6.50798E-04	1.34895E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.60874E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994251836E-00	S2N	1.05487E-09	SN	3.24788E-05
B	4.592672000E-04	S2B	5.12981E-13	SB	7.16227E-07
C	-5.421003088E-08	S2C	6.32230E-18	SC	2.51441E-09
D	1.801342008E-11	S2D	1.68262E-23	SD	4.10197E-12
E	-5.554591524E-15	S2E	5.29179E-30	SE	2.30039E-15

COVARIANCES

S2BC	-1.76874E-15	S2BD	2.81519E-18	S2BE	-1.54566E-21
S2BN	-2.18260E-11	S2CD	-1.02576E-20	S2CE	5.69870E-24
S2CN	7.07944E-14	S2DE	-9.41408E-27	S2DN	-1.09451E-16
S2EN	5.90894E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (TT31

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-40-1		
0	5.68732E+02	5.68732E+02	0.00000E-99	0.00000E-99
1	2.54995E+02	2.54995E+02	-4.24029E-04	-1.66189E-06
2	1.21103E+02	1.21103E+02	3.04805E-04	4.18465E-06
3	5.91370E+01	5.91349E+01	7.70844E-04	1.31400E-05
4	2.92615E+01	2.92620E+01	-5.01053E-04	-1.71282E-05
5	1.45761E+01	1.45764E+01	-2.09980E-04	-1.10813E-05
6	7.28521E-00	7.28504E-00	1.69921E-04	2.26370E-05
7	3.64683E-00	3.64697E-00	-1.36295E-04	-3.74136E-05
		RUN NO. HE-40-2		
0	8.10221E+02	8.10221E+02	0.00000E-99	0.00000E-99
1	3.49345E+02	3.49351E+02	-4.53525E-04	1.29676E-06
2	1.62928E+02	1.62908E+02	-4.83275E-04	-4.19234E-06
3	7.88124E+01	7.84507E+01	4.55801E-04	5.78052E-06
4	3.88492E+01	3.88492E+01	-4.02817E-04	-1.03712E-05
5	1.93105E+01	1.93109E+01	-1.15236E-04	-2.16031E-05
6	9.64095E-00	9.64109E-00	-1.34295E-04	-1.39270E-05
7	4.82445E-00	4.82479E-00	6.30198E-04	1.34295E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.00736E-07

PARAMETERS	VARIANCES	STANDARD ERRORS
A 1.99425183E-00	S2A 1.05449E-03	SA 3.24788E-03
B 4.59261200E-04	S2B 5.12911E-13	SB 7.16227E-07
C -5.42100308E-08	S2C 6.32230E-18	SC 2.51441E-09
D 1.80184200E-11	S2D 1.08226E-23	SD 4.10197E-12
E -5.55495125E-15	S2E 5.24172E-30	SE 2.30039E-15

COVARIANCES

S2BC -1.79874E-15	S2BD 2.81314E-18	S2BE -1.55606E-21
S2BN -2.48260E-11	S2CD -1.02572E-24	S2CE 5.69720E-24
S2CN 7.07944E-14	S2DE -9.41408E-27	S2DN -1.09435E-16
S2EN 5.90894E-20		

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-50-1		
0	6.0495582E+02	6.0495582E+02	0.00000E-99	0.00000E-99
1	2.7056495E+02	2.7056590E+02	-9.46877E-04	-3.49963E-06
2	1.2835749E+02	1.2835616E+02	1.32274E-03	1.03051E-05
3	6.2627256E+01	6.2627162E+01	9.39511E-05	1.50016E-06
4	3.0978954E+01	3.0979007E+01	-5.30774E-05	-1.71333E-06
5	1.5428277E+01	1.5428372E+01	-9.42140E-05	-6.10658E-06
6	7.7095990E-00	7.7097583E-00	-1.59327E-04	-2.06661E-05
7	3.8595829E-00	3.8591797E-00	4.03243E-04	1.04478E-04
		RUN NO. HE-50-2		
0	7.8489453E+02	7.8489453E+02	0.00000E-99	0.00000E-99
1	3.4126500E+02	3.4126416E+02	8.44203E-04	2.47374E-06
2	1.5976533E+02	1.5976639E+02	-1.06045E-03	-6.63758E-06
3	7.7456989E+01	7.7456528E+01	4.61429E-04	5.95723E-06
4	3.8194153E+01	3.8194380E+01	-2.27615E-04	-5.95943E-06
5	1.8991561E+01	1.8992203E+01	-6.41644E-04	-3.37857E-05
6	9.4831807E-00	9.4832763E-00	-9.55755E-05	-1.00784E-05
7	4.7453615E-00	4.7450828E-00	2.78688E-04	5.87286E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.42240E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994388422E-00	S2N	1.01437E-09	SN	3.18492E-05
B	4.435613054E-04	S2B	4.92145E-13	SB	7.01530E-07
C	-5.261898000E-08	S2C	5.92396E-18	SC	2.43392E-09
D	1.871626728E-11	S2D	1.52475E-23	SD	3.90481E-12
E	-6.096464033E-15	S2E	4.70708E-30	SE	2.16958E-15

COVARIANCES

S2BC	-1.68041E-15	S2BD	2.63820E-18	S2BE	-1.43759E-21
S2BN	-2.10275E-11	S2CD	-9.45795E-21	S2CE	5.20846E-24
S2CN	6.78720E-14	S2DE	-8.45205E-27	S2DN	-1.03805E-16
S2EN	5.57073E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (121°F)

R	P, OBS., ATM	P, CALC., ATM	P.OBS.-P.CAL.
		RUN NO. HE-50-1	
0	6.04955826E+02	6.04955826E+02	0.00000E-99
1	2.70564955E+02	2.70563906E+02	-9.46877E-04
2	1.28357496E+02	1.28356146E+02	1.32274E-03
3	6.26272596E+01	6.26271825E+01	9.39511E-05
4	3.09728854E+01	3.09729001E+01	-5.30774E-05
5	1.54282772E+01	1.54284372E+01	-9.42140E-05
6	7.70952990E-00	7.70972836E-00	-1.59327E-04
7	3.85958296E-00	3.85917072E-00	4.03243E-04
		RUN NO. HE-50-2	
0	7.84894536E+02	7.84894536E+02	0.00000E-99
1	3.41265006E+02	3.41264616E+02	8.44203E-04
2	1.59726536E+02	1.59726429E+02	-1.06043E-03
3	7.74564098E+01	7.74564328E+01	4.01429E-04
4	3.81941536E+01	3.81941800E+01	-2.27615E-04
5	1.89918616E+01	1.89920201E+01	-6.41644E-04
6	9.48318017E-00	9.48[illegible]2765E-00	-9.55125E-05
7	4.74536156E-00	4.74[illegible]08226E-00	2.78608E-04

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.42246E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.99438842E-00	S2N	1.01437E-09	SN	3.18492E-05
B	4.43561305464E-04	S2B	4.92145E-13	SB	7.01320E-07
C	-5.26189800006E-08	S2C	5.92396E-18	SC	2.43926E-09
D	1.87162672861E-11	S2D	1.52472E-23	SD	3.90481E-12
E	-6.09964403361E-15	S2E	4.70708E-30	SE	2.16958E-15

COVARIANCES

S2BC	-1.60416E-15	S2BD	2.63820E-18	S2BE	-1.43759E-21
S2BN	-2.10275E-11	S2CD	-9.45795E-21	S2CE	5.20466E-24
S2CN	6.78726E-14	S2DE	-8.45205E-27	S2DN	-1.03805E-16
S2EN	5.57073E-26				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

60 DEGREE C HELIUM ISOTHERM, 333.136 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-60-1		
0	6.1368216E+02	6.1368216E+02	0.00000E-99	0.00000E-99
1	2.7504823E+02	2.7504813E+02	1.02417E-04	3.72363E-07
2	1.3060477E+02	1.3060494E+02	-1.64254E-04	-1.25764E-06
3	6.3751354E+01	6.3751216E+01	1.38504E-04	2.17256E-06
4	3.1540884E+01	3.1540956E+01	-7.21062E-05	-2.28611E-06
5	1.5709190E+01	1.5709471E+01	-2.80928E-04	-1.78830E-05
6	7.8504353E-00	7.8504281E-00	7.16920E-06	9.13223E-07
7	3.9299255E-00	3.9295912E-00	3.34334E-04	8.50740E-05
		RUN NO. HE-60-2		
0	7.9814938E+02	7.9814938E+02	0.00000E-99	0.00000E-99
1	3.4782546E+02	3.4782548E+02	-2.23376E-05	-6.42209E-08
2	1.6300151E+02	1.6300165E+02	-1.35709E-04	-8.32566E-07
3	7.9060313E+01	7.9060023E+01	2.89635E-04	3.66347E-06
4	3.8992667E+01	3.8992679E+01	-1.13809E-05	-2.91874E-07
5	1.9390697E+01	1.9390727E+01	-3.05597E-05	-1.57600E-06
6	9.6826378E-00	9.6825265E-00	1.11262E-04	1.14909E-05
7	4.8445264E-00	4.8447799E-00	-2.53547E-04	-5.23369E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 7.77803E-08

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994441104E-00	S2N	3.18317E-10	SN	1.78414E-05
B	4.290122949E-04	S2B	1.48926E-13	SB	3.85909E-07
C	-5.183690101E-08	S2C	1.73521E-18	SC	1.31727E-09
D	2.044850731E-11	S2D	4.32281E-24	SD	2.07913E-12
E	-7.159557929E-15	S2E	1.29214E-30	SE	1.13672E-15

COVARIANCES

S2BC	-5.00266E-16	S2BD	7.72582E-19	S2BE	-4.14206E-22
S2BN	-6.47922E-12	S2CD	-2.72542E-21	S2CE	1.47679E-24
S2CN	2.05720E-14	S2DE	-2.35786E-27	S2DN	-3.09452E-17
S2EN	1.63377E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

60 DEGREE C HELIUM ISOTHERM, 533.136 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-MD-1		
0	6.136821E+02	6.136821E+02	0.000000E-99	0.000000E-99
1	2.750482E+02	2.750481E+02	1.024117E-04	3.723463E-07
2	1.306047E+02	1.306094E+02	1.625256E-04	-1.251746E-04
3	6.375135E+01	6.375121E+01	1.385041E-04	2.172556E-04
4	3.154088E+01	3.154005E+01	-7.210621E-05	-2.286116E-04
5	1.570190E+01	1.570411E+01	-2.200286E-04	-1.788306E-05
6	7.850435E-00	7.850428E-00	7.169206E-06	9.132236E-07
7	3.929592E-00	3.929512E-00	3.343536E-04	8.507406E-05
		RUN NO. HE-MD-2		
0	7.981495E+02	7.981495E+02	0.000000E-99	0.000000E-99
1	3.472854E+02	3.472854E+02	-2.231761E-05	-6.422096E-08
2	1.630015E+02	1.630015E+02	-1.357096E-04	-8.325466E-07
3	7.906031E+01	7.906036E+01	2.389356E-04	3.664347E-06
4	3.899264E+01	3.899247E+01	-1.138096E-05	-2.918746E-07
5	1.993069E+01	1.993072E+01	-3.055976E-05	-1.576006E-06
6	9.682631E-00	9.682636E-00	5.134196E-06	1.349006E-05
7	4.844526E-00	4.844779E-00	-2.535476E-04	-5.234696E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 7.771803E-08

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994441104E-00	S2N	3.183136E-10	SN	1.784146E-05
B	4.290122974E-04	S2B	1.497256E-13	SB	3.849096E-07
C	-5.183699101E-08	S2C	1.735216E-18	SC	1.317216E-09
D	2.044850731E-11	S2D	4.322816E-24	SD	2.079136E-12
E	-7.159557929E-15	S2E	1.293147E-30	SE	1.136172E-15

COVARIANCES

S2BC	-5.002646E-16	S2BD	7.172582E-19	S2BE	-4.142066E-22
S2BN	-6.479226E-12	S2CD	-2.172646E-21	S2CE	1.461636E-24
S2CN	2.057206E-14	S2DE	-2.353106E-27	S2DN	-3.094526E-17
S2EN	1.633176E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

70 DEGREE C HELIUM ISOTHERM, 343.136 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-70-1		
0	5.7886148E+02	5.7886148E+02	0.00000E-99	0.00000E-99
1	2.6171395E+02	2.6171498E+02	-1.02675E-03	-3.92319E-06
2	1.2478250E+02	1.2478178E+02	7.20645E-04	5.77520E-06
3	6.1028749E+01	6.1028262E+01	4.86348E-04	7.96917E-06
4	3.0222978E+01	3.0222859E+01	1.18498E-04	3.92079E-06
5	1.5060307E+01	1.5060223E+01	8.33518E-05	5.53453E-06
6	7.5279404E-00	7.5278280E-00	1.12390E-04	1.49297E-05
7	3.7690647E-00	3.7685932E-00	4.71550E-04	1.25110E-04
		RUN NO. HE-70-2		
0	7.6238843E+02	7.6238843E+02	0.00000E-99	0.00000E-99
1	3.3530771E+02	3.3530689E+02	8.21818E-04	2.45093E-06
2	1.5780425E+02	1.5780467E+02	-4.18512E-04	-2.65209E-06
3	7.6694381E+01	7.6694138E+01	2.42644E-04	3.16378E-06
4	3.7862484E+01	3.7863084E+01	-6.00155E-04	-1.58509E-05
5	1.8837674E+01	1.8838223E+01	-5.48826E-04	-2.91344E-05
6	9.4086092E-00	9.4089812E-00	-3.72026E-04	-3.95410E-05
7	4.7085501E-00	4.7085180E-00	3.21162E-05	6.82083E-06

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.25744E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994419545E-00	S2N	9.70730E-10	SN	3.11565E-05
B	4.160525293E-04	S2B	4.93006E-13	SB	7.02144E-07
C	-5.306982149E-08	S2C	6.33756E-18	SC	2.51745E-09
D	2.535551690E-11	S2D	1.74129E-23	SD	4.17288E-12
E	-1.014541138E-14	S2E	5.74687E-30	SE	2.39726E-15

COVARIANCES

S2BC	-1.73904E-15	S2BD	2.81864E-18	S2BE	-1.58705E-21
S2BN	-2.05785E-11	S2CD	-1.04519E-20	S2CE	5.94968E-24
S2CN	6.85694E-14	S2DE	-9.97966E-27	S2DN	-1.08181E-16
S2EN	5.99581E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

70 DEGREE C MELTON ISOTHERM, 343.136 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-70-1		
0	5.78861486E+02	5.78861486E+02	0.00000E-99	0.00000E-99
1	2.61171995E+02	2.61171998E+02	-1.02675E-03	-3.92319E-06
2	1.24782506E+02	1.24781178E+02	7.20645E-04	5.77520E-06
3	6.10287496E+01	6.10282625E+01	4.86348E-04	7.96917E-06
4	3.02229786E+01	3.02229859E+01	1.16498E-04	3.92079E-06
5	1.50603076E+01	1.50602238E+01	8.39518E-05	5.53495E-06
6	7.52794046E-00	7.52782806E-00	1.12390E-04	1.49297E-05
7	3.76906476E-00	3.76895326E-00	4.71505E-04	1.25110E-04
		RUN NO. HE-70-2		
0	7.62388496E+02	7.62398496E+02	0.00000E-99	0.00000E-99
1	3.35307711E+02	3.35308806E+02	8.21818E-04	2.45093E-06
2	1.57904256E+02	1.57804611E+02	-4.18612E-04	-2.65209E-06
3	7.66943816E+01	7.66943816E+01	2.44446E-04	3.18378E-06
4	3.78624846E+01	3.78630846E+01	-6.00155E-04	-1.58509E-05
5	1.88376746E+01	1.88382236E+01	-5.48826E-04	-2.91344E-05
6	9.40866072E-00	9.40891506E-00	-3.43120E-04	-3.37174E-05
7	4.70835016E-00	4.70851506E-00	3.21186E-05	6.82083E-06

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 2.25744E-07

PARAMETERS	VARIANCES	STANDARD ERRORS
N 1.99441956E-00	S2N 9.10232E-10	SN 3.11565E-05
B 4.16052529E-04	S2B 4.53004E-13	SB 7.02144E-07
C -5.30908214E-08	S2C 6.23158E-18	SC 2.51745E-09
D 2.53551646E-11	S2D 1.74125E-23	SD 4.17288E-12
E -1.01454113E-14	S2E 5.74807E-30	SE 2.39726E-15

COVARIANCES

S2BC -1.73984E-15	S2BD 2.81844E-18	S2BE -1.58705E-21
S2BN -2.05785E-11	S2CD -1.04515E-20	S2CE 5.99588E-24
S2CN 6.85494E-14	S2DE -9.97964E-27	S2DN -1.08181E-16
S2EN 5.99518E-20		

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

80 DEGREE C HELIUM ISOTHERM, 353.138 K (TTS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-80-1		
0	5.8853422E+02	5.8853422E+02	0.00000E-99	0.00000E-99
1	2.6650477E+02	2.6650475E+02	2.24452E-05	8.42208E-08
2	1.2715418E+02	1.2715387E+02	3.13721E-04	2.46724E-06
3	6.2209346E+01	6.2208961E+01	3.84232E-04	6.17644E-06
4	3.0812070E+01	3.0812460E+01	-3.90415E-04	-1.26708E-05
5	1.5354567E+01	1.5355162E+01	-5.95226E-04	-3.87654E-05
6	7.6752014E-00	7.6754974E-00	-2.95940E-04	-3.85580E-05
7	3.8427542E-00	3.8425613E-00	1.92941E-04	5.02090E-05
		RUN NO. HE-80-2		
0	7.6654508E+02	7.6654508E+02	0.00000E-99	0.00000E-99
1	3.3820312E+02	3.3820315E+02	-3.26278E-05	-9.64740E-08
2	1.5939354E+02	1.5939354E+02	7.53500E-06	4.72729E-08
3	7.7517197E+01	7.7518438E+01	-1.24037E-03	-1.60013E-05
4	3.8284059E+01	3.8282517E+01	1.54229E-03	4.02855E-05
5	1.9049742E+01	1.9049901E+01	-1.58813E-04	-8.33677E-06
6	9.5153531E-00	9.5154055E-00	-5.23859E-05	-5.50541E-06
7	4.7622373E-00	4.7619263E-00	3.10992E-04	6.53039E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 3.45891E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.994440198E-00	S2N	1.47383E-09	SN	3.83906E-05
B	4.025148886E-04	S2B	7.31666E-13	SB	8.55375E-07
C	-4.915748213E-08	S2C	9.19839E-18	SC	3.03288E-09
D	2.099695213E-11	S2D	2.46834E-23	SD	4.96824E-12
E	-7.628573213E-15	S2E	7.97407E-30	SE	2.82384E-15

COVARIANCES

S2BC	-2.55284E-15	S2BD	4.08998E-18	S2BE	-2.27850E-21
S2BN	-3.09010E-11	S2CD	-1.49924E-20	S2CE	8.44328E-24
S2CN	1.01900E-13	S2DE	-1.39957E-26	S2DN	-1.58952E-16
S2EN	8.71744E-20				

TABLE 5. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, PARAMETERS, STANDARD ERRORS, VARIANCES, AND COVARIANCES - CONTINUED

80 DEGREE C HELIUM ISOTHERM, 353.138 K (ITS)

R	P, OBS., ATM	P, CAL., ATM	P,OBS.-P,CAL.	REL. ERROR IN P
		RUN NO. HE-80-1		
0	5.88534225E+02	5.88534225E+02	0.00000E-99	0.00000E-99
1	2.66504775E+02	2.66504775E+02	2.74452E-05	8.42208E-08
2	1.27155185E+02	1.27155185E+02	3.13721E-04	2.46724E-06
3	6.22093466E+01	6.22093466E+01	3.84325E-04	6.17644E-06
4	3.08120706E+01	3.08120706E+01	-3.90415E-04	-1.26708E-05
5	1.53545576E+01	1.53545576E+01	-5.95264E-04	-3.87054E-05
6	7.67520146E-00	7.67520146E-00	-2.59906E-04	-3.85808E-05
7	3.84275426E-00	3.84275426E-00	1.29041E-04	5.02090E-05
		RUN NO. HE-80-2		
0	7.66454508E+02	7.66454508E+02	0.00000E-99	0.00000E-99
1	3.38203125E+02	3.38203125E+02	-3.26218E-05	-9.64740E-08
2	1.59393584E+02	1.59393584E+02	7.53500E-06	4.72728E-08
3	7.75117976E+01	7.75117976E+01	-1.24037E-02	-1.60012E-05
4	3.82840596E+01	3.82840596E+01	1.54220E-03	4.02855E-05
5	1.90497426E+01	1.90497426E+01	-1.55041E-04	-8.32617E-06
6	9.51335316E-00	9.51335316E-00	3.10942E-04	3.26903E-05
7	4.76223736E-00	4.76223736E-00	3.10942E-04	6.53039E-05

SUM OF THE WEIGHTED SQUARES OF THE RESIDUALS 3.45891E-07

PARAMETERS		VARIANCES		STANDARD ERRORS	
N	1.99444019OE-00	S2N	1.47384E-09	SN	3.83906E-05
B	4.02516488OE-04	S2B	7.31656E-13	SB	8.55316E-07
C	-4.91574821E-08	S2C	9.10279E-18	SC	3.03288E-09
D	2.09909521E-11	S2D	2.44634E-23	SD	4.94824E-12
E	-7.62857321E-15	S2E	7.97497E-30	SE	2.82384E-15

COVARIANCES

S2BC	-2.55284E-15	S2BD	4.08908E-18	S2BE	-2.27850E-21
S2BN	-3.09018E-11	S2CD	-1.49924E-28	S2CE	8.44328E-24
S2CN	1.61900E-13	S2DE	-1.39937E-26	S2DN	-1.58052E-16
S2EN	8.71744E-20				

Variances and covariances for integral pressures are listed in table 6.

Compressibility factors and their standard errors are listed in table 7 for integral pressures.

Table 8 is a summary of the various parameters for different isotherms, and table 9 is a summary of the compressibility factors at 1, 200, 400, and 800 atmospheres. Data for helium at 0° C included in tables 8 and 9, were obtained from a previous report (4).

The parameters B and C can be represented as a function of absolute temperature by the equations

$$B = B_1 T^{-1/4} + B_2 T^{-3/4} , \qquad (2)$$

and

$$C = C_1 T^{-1/4} + C_2 T^{-3/4} . \qquad (3)$$

Equations 2 and 3 are similar to the ones used by Dalton and Barieau (7) to represent the data of Wiebe, Gaddy, and Heins (10).

Least squares values for the parameters of equations 2 and 3 are;

$$B_1 = (-1.40152 \pm 0.03247) \times 10^{-3} ,$$

$$B_2 = (5.90633 \pm 0.05665) \times 10^{-2} ,$$

$$C_1 = (2.4982 \pm 0.7279) \times 10^{-7} , \text{ and}$$

$$C_2 = (-8.6386 \pm 1.2699) \times 10^{-6} .$$

The temperature T is

$$T = t + 273.15, \text{ K}$$

where

$$t = \text{thermodynamic temperature, } ^\circ\text{C}.$$

Variances and covariances for integral pressures are listed in table 6.

Compressibility factors and their standard errors are listed in table 7 for integral pressures.

Table 8 is a summary of the various parameters for different isotherms, and table 9 is a summary of the compressibility factors at 1, 200, 400, and 800 atmospheres. Data for helium at 0° C included in tables 8 and 9, were obtained from a previous report (4).

The parameters B and C can be represented as a function of absolute temperature by the equations

$$B = B_1 T^{1/2} + B_2 T^{-3/2} \quad (2)$$

and

$$C = C_1 T^{-1/2} + C_2 T^{-3/2} \quad (3)$$

Equations 2 and 3 are similar to the ones used by Dalton and Berlean (7) to represent the data of Wiebe, Gaddy, and Heins (10).

Least squares values for the parameters of equations 2 and 3 are:

$$B_1 = (-1.40152 \pm 0.01247) \times 10^{-3} \ ,$$

$$B_2 = (5.90633 \pm 0.05665) \times 10^{-2} \ ,$$

$$C_1 = (2.49824 \pm 0.12731) \times 10^{-7} \ , \text{ and}$$

$$C_2 = (-8.63801 \pm 1.26991) \times 10^{-6} \ .$$

The temperature T is

$$T = t + 273.15, \ K$$

where

t = thermodynamic temperature, °C.

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES

-5 DEGREE C HELIUM ISOTHERM, 268.153 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	5.51584E-09	5.72006E-11	-1.82397E-13
2.000E-00	1.24197E-08	8.20355E-11	-2.58565E-13
5.000E-00	2.76351E-08	1.04815E-10	-3.18592E-13
1.000E+01	3.85432E-08	7.85486E-11	-2.12828E-13
2.500E+01	7.83113E-08	-9.69459E-11	3.86172E-13
5.000E+01	2.25189E-07	-2.84421E-10	9.49985E-13
7.500E+01	3.29381E-07	-2.52341E-10	7.31044E-13
1.000E+02	4.46326E-07	-6.45672E-11	-1.36209E-14
1.250E+02	6.95151E-07	1.92186E-10	-9.64000E-13
1.500E+02	1.07417E-06	4.41547E-10	-1.84517E-12
2.000E+02	1.74271E-06	7.05236E-10	-2.65300E-12
2.500E+02	1.93356E-06	4.91431E-10	-1.64949E-12
3.000E+02	2.77433E-06	-1.67714E-10	9.75254E-13
3.500E+02	5.69810E-06	-1.04899E-09	4.34355E-12
4.000E+02	9.91931E-06	-1.82654E-09	7.22024E-12
4.500E+02	1.23300E-05	-2.16389E-09	8.35467E-12
5.000E+02	1.08612E-05	-1.80686E-09	6.82467E-12
6.000E+02	1.17703E-05	1.04234E-09	-4.22725E-12
7.000E+02	2.94801E-05	3.62874E-09	-1.38703E-11
8.000E+02	6.05879E-05	-4.21648E-09	1.65099E-11
9.000E+02	3.10808E-03	-4.24159E-08	1.61962E-10
1.000E+03	3.27907E-02	-1.43094E-07	5.42998E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	2.81803E-16	-1.52993E-19
2.000E-00	3.97472E-16	-2.15177E-19
5.000E-00	4.81947E-16	-2.58537E-19
1.000E+01	3.04570E-16	-1.58082E-19
2.500E+01	-6.42086E-16	3.61540E-19
5.000E+01	-1.47655E-15	8.01308E-19
7.500E+01	-1.04650E-15	5.38000E-19
1.000E+02	2.09470E-16	-1.76583E-19
1.250E+02	1.76419E-15	-1.04564E-18
1.500E+02	3.17011E-15	-1.81903E-18
2.000E+02	4.33678E-15	-2.41497E-18
2.500E+02	2.48081E-15	-1.29753E-18
3.000E+02	-2.01785E-15	1.29440E-18
3.500E+02	-7.65861E-15	4.49494E-18
4.000E+02	-1.23705E-14	7.12414E-18
4.500E+02	-1.40810E-14	8.01061E-18
5.000E+02	-1.12871E-14	6.31560E-18
6.000E+02	7.57972E-15	-4.58368E-18
7.000E+02	2.35001E-14	-1.35200E-17
8.000E+02	-2.86968E-14	1.69071E-17
9.000E+02	-2.75011E-13	1.58731E-16
1.000E+03	-9.17238E-13	5.27090E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES

-5 DEGREE C HELIUM ISOTHERM, 268.153 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	5.51584E-09	5.72005E-11	-1.82397E-13
2.000E-00	1.24197E-08	8.20958E-11	-2.58565E-13
5.000E-00	2.76351E-08	1.09615E-10	-3.18592E-13
1.000E+01	3.85432E-08	7.85486E-11	-2.12826E-13
2.500E+01	7.83113E-08	-9.69457E-11	3.86172E-13
5.000E+01	2.25189E-07	-2.88412E-10	9.49085E-13
7.500E+01	3.29381E-07	-2.53491E-10	7.31044E-13
1.000E+02	4.46326E-07	-6.45727E-11	-1.36209E-14
1.250E+02	6.95151E-07	1.92188E-10	-9.88000E-13
1.500E+02	1.07417E-06	8.91547E-10	-1.88517E-12
2.000E+02	1.74271E-06	7.05236E-10	-2.65300E-12
2.500E+02	1.93356E-06	8.91031E-10	-1.69908E-12
3.000E+02	2.77433E-06	-1.65714E-10	0.75254E-13
3.500E+02	5.69810E-06	-1.04059E-09	4.34355E-12
4.000E+02	9.91931E-06	-1.82456E-09	7.22024E-12
4.500E+02	1.23300E-05	-2.14136E-09	8.35464E-12
5.000E+02	1.08612E-05	-1.09084E-09	6.82464E-12
5.500E+02	1.17103E-05	1.09284E-09	-4.22725E-12
6.000E+02	2.94801E-05	3.02874E-09	-1.38703E-11
7.000E+02	6.05879E-05	-4.21648E-09	1.65097E-11
8.000E+02	3.10808E-03	-4.24159E-08	1.61956E-10
9.000E+02	3.27907E-02	-1.49084E-07	5.42998E-10
1.000E+03	-9.17238E-13	5.27090E-16	

PRESSURE, ATM	S2DP	S2EP
1.000E-00	2.81803E-16	-1.52093E-19
2.000E-00	3.97472E-16	-2.16177E-19
5.000E-00	4.81947E-16	-2.58537E-19
1.000E+01	3.04570E-16	-1.58062E-19
2.500E+01	-6.42086E-16	3.61340E-19
5.000E+01	-1.47655E-15	8.01300E-19
7.500E+01	-1.04650E-15	5.35000E-19
1.000E+02	2.09470E-16	-1.76538E-19
1.250E+02	1.76419E-15	-1.04656E-18
1.500E+02	3.17011E-15	-1.81903E-18
2.000E+02	4.33478E-15	-2.91497E-18
2.500E+02	2.48081E-15	-1.29753E-18
3.000E+02	-2.01785E-15	1.29446E-18
3.500E+02	-7.05861E-15	4.44949E-18
4.000E+02	-1.23705E-14	7.12414E-18
4.500E+02	-1.40810E-14	8.01061E-18
5.000E+02	-1.12871E-14	6.31580E-18
6.000E+02	7.57972E-15	-4.58348E-18
7.000E+02	2.35001E-14	-1.35200E-17
8.000E+02	-2.86968E-14	1.49017E-17
9.000E+02	-2.75011E-13	1.58731E-16
1.000E+03	-9.17238E-13	5.27090E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

10 DEGREE C HELIUM ISOTHERM, 283.146 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	1.47304E-09	1.50519E-11	-4.82311E-14
2.000E-00	3.32754E-09	2.16093E-11	-6.84079E-14
5.000E-00	7.46357E-09	2.76993E-11	-8.44456E-14
1.000E+01	1.05162E-08	2.09662E-11	-5.68279E-14
2.500E+01	2.11841E-08	-2.47995E-11	1.00461E-13
5.000E+01	6.07531E-08	-7.41780E-11	2.48802E-13
7.500E+01	9.06252E-08	-6.67958E-11	1.92822E-13
1.000E+02	1.23230E-07	-1.93480E-11	1.13561E-15
1.250E+02	1.87427E-07	4.55966E-11	-2.41781E-13
1.500E+02	2.82724E-07	1.08298E-10	-4.64056E-13
2.000E+02	4.55110E-07	1.72782E-10	-6.55240E-13
2.500E+02	5.37377E-07	1.16396E-10	-3.80241E-13
3.000E+02	8.04686E-07	-4.78957E-11	2.90661E-13
3.500E+02	1.51874E-06	-2.57145E-10	1.10500E-12
4.000E+02	2.35001E-06	-4.22321E-10	1.71903E-12
4.500E+02	2.55003E-06	-4.53186E-10	1.79165E-12
5.000E+02	2.01707E-06	-2.83396E-10	1.07906E-12
6.000E+02	5.74763E-06	6.54443E-10	-2.62758E-12
7.000E+02	1.67511E-05	1.50250E-09	-5.86369E-12
8.000E+02	8.38480E-06	-5.71652E-10	2.33575E-12
9.000E+02	8.10278E-04	-1.10790E-08	4.31233E-11
1.000E+03	9.33775E-03	-3.88972E-08	1.50422E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	7.51625E-17	-4.10993E-20
2.000E-00	1.06026E-16	-5.77969E-20
5.000E-00	1.28643E-16	-6.94372E-20
1.000E+01	8.16125E-17	-4.25215E-20
2.500E+01	-1.69380E-16	9.62988E-20
5.000E+01	-3.89502E-16	2.12634E-19
7.500E+01	-2.75677E-16	1.41657E-19
1.000E+02	5.28515E-17	-4.73179E-20
1.250E+02	4.54836E-16	-2.73917E-19
1.500E+02	8.11728E-16	-4.71230E-19
2.000E+02	1.07983E-15	-6.04739E-19
2.500E+02	5.57162E-16	-2.84748E-19
3.000E+02	-6.17762E-16	4.02172E-19
3.500E+02	-2.00527E-15	1.19919E-18
4.000E+02	-3.01864E-15	1.76783E-18
4.500E+02	-3.08296E-15	1.77919E-18
5.000E+02	-1.79487E-15	1.00554E-18
6.000E+02	4.64412E-15	-2.75670E-18
7.000E+02	1.01177E-14	-5.88950E-18
8.000E+02	-4.20302E-15	2.53400E-18
9.000E+02	-7.44483E-14	4.34044E-17
1.000E+03	-2.58401E-13	1.50070E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

10 DEGREE C HELIUM ISOTHERM, 283.146 K (171)

PRESSURE, ATM	S2P	C2SP	S2CP
1.000E-00	1.470E-09	1.505E-11	-4.823E-14
2.000E-00	3.327E-09	2.180E-11	-6.807E-14
5.000E-00	7.463E-09	2.709E-11	-8.446E-14
1.000E+01	1.051E-08	2.094E-11	-5.027E-14
2.500E+01	2.118E-08	-2.479E-11	1.004E-13
5.000E+01	6.075E-08	-7.412E-11	2.480E-13
7.500E+01	9.064E-08	-6.479E-11	1.928E-13
1.000E+02	1.232E-07	-1.934E-11	1.135E-13
1.250E+02	1.874E-07	4.559E-11	-2.417E-13
1.500E+02	2.827E-07	1.082E-10	-4.605E-13
2.000E+02	4.511E-07	1.272E-10	-6.552E-13
2.500E+02	5.377E-07	1.163E-10	-3.802E-13
3.000E+02	8.048E-07	-4.184E-11	2.908E-13
3.500E+02	1.518E-06	-3.471E-10	1.109E-12
4.000E+02	2.350E-06	-4.223E-10	1.219E-12
4.500E+02	2.550E-06	-4.531E-10	1.791E-12
5.000E+02	2.017E-06	-2.483E-10	1.079E-12
6.000E+02	3.174E-06	3.172E-10	-2.225E-12
7.000E+02	1.675E-05	1.302E-09	-5.463E-12
8.000E+02	8.589E-06	-4.714E-10	2.395E-12
9.000E+02	8.102E-04	-1.107E-08	4.312E-11
1.000E+03	4.337E-03	-3.087E-08	1.504E-10

PRESSURE, ATM	S2DP	C2SP
1.000E-00	7.516E-17	-4.109E-20
2.000E-00	1.060E-16	-5.270E-20
5.000E-00	1.284E-16	-6.937E-20
1.000E+01	8.101E-17	-4.251E-20
2.500E+01	-1.693E-16	9.029E-20
5.000E+01	-3.895E-16	2.125E-19
7.500E+01	-2.756E-16	1.485E-19
1.000E+02	5.285E-17	-4.127E-20
1.250E+02	4.543E-16	-2.791E-19
1.500E+02	6.117E-16	-4.214E-19
2.000E+02	1.079E-15	-4.034E-19
2.500E+02	5.571E-16	-2.847E-19
3.000E+02	-4.177E-16	4.621E-19
3.500E+02	-2.005E-15	1.129E-18
4.000E+02	-3.018E-15	1.284E-18
4.500E+02	-3.082E-15	1.177E-18
5.000E+02	-1.198E-15	1.009E-18
6.000E+02	4.644E-15	-2.756E-18
7.000E+02	1.011E-14	-5.889E-18
8.000E+02	-4.203E-15	2.534E-18
9.000E+02	-7.448E-14	4.340E-17
1.000E+03	-2.584E-13	1.500E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

20 DEGREE C HELIUM ISOTHERM, 293.139 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	4.24171E-08	4.27460E-10	-1.34437E-12
2.000E-00	9.59312E-08	6.15130E-10	-1.91282E-12
5.000E-00	2.15340E-07	7.93803E-10	-2.38370E-12
1.000E+01	3.01902E-07	6.11516E-10	-1.65076E-12
2.500E+01	5.95354E-07	-6.79577E-10	2.70157E-12
5.000E+01	1.71951E-06	-2.11613E-09	6.99517E-12
7.500E+01	2.53898E-06	-1.95834E-09	5.67541E-12
1.000E+02	3.38329E-06	-6.39434E-10	4.79364E-13
1.250E+02	5.15883E-06	1.22486E-09	-6.34867E-12
1.500E+02	7.95022E-06	3.08398E-09	-1.28527E-11
2.000E+02	1.32307E-05	5.22316E-09	-1.94709E-11
2.500E+02	1.48596E-05	3.98953E-09	-1.34338E-11
3.000E+02	1.99861E-05	-5.09840E-10	4.35687E-12
3.500E+02	3.94409E-05	-6.78871E-09	2.81014E-11
4.000E+02	6.97248E-05	-1.25889E-08	4.93405E-11
4.500E+02	8.99137E-05	-1.55164E-08	5.92839E-11
5.000E+02	8.29452E-05	-1.36832E-08	5.11583E-11
6.000E+02	7.93133E-05	5.43993E-09	-2.22886E-11
7.000E+02	2.10220E-04	2.55485E-08	-9.65778E-11
8.000E+02	2.92561E-04	-2.08895E-08	8.15095E-11
9.000E+02	1.76074E-02	-2.68645E-07	1.01294E-09
1.000E+03	1.96648E-01	-9.37295E-07	3.51035E-09

PRESSURE, ATM	S2DP	S2EP
1.000E-00	2.04449E-15	-1.09473E-18
2.000E-00	2.89452E-15	-1.54552E-18
5.000E-00	3.55108E-15	-1.87923E-18
1.000E+01	2.33531E-15	-1.19844E-18
2.500E+01	-4.44161E-15	2.47236E-18
5.000E+01	-1.07223E-14	5.74515E-18
7.500E+01	-8.06658E-15	4.11374E-18
1.000E+02	5.93533E-16	-7.56780E-19
1.250E+02	1.16135E-14	-6.84075E-18
1.500E+02	2.18558E-14	-1.24073E-17
2.000E+02	3.14371E-14	-1.73033E-17
2.500E+02	2.01811E-14	-1.05310E-17
3.000E+02	-9.97500E-15	6.65787E-18
3.500E+02	-4.92275E-14	2.86674E-17
4.000E+02	-8.35847E-14	4.76218E-17
4.500E+02	-9.86808E-14	5.55023E-17
5.000E+02	-8.36190E-14	4.62986E-17
6.000E+02	4.03003E-14	-2.45328E-17
7.000E+02	1.61666E-13	-9.20356E-17
8.000E+02	-1.41024E-13	8.27574E-17
9.000E+02	-1.69691E-12	9.67939E-16
1.000E+03	-5.84710E-12	3.31904E-15

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

20 DEGREE C HELIUM ISOTHERM, 293.139 K (ITS)

PRESSURE, ATM	S2P	S2DP	S2CP
1.0000E-00	4.2417IE-08	4.2746OE-10	-1.3443IE-12
2.0000E-00	9.5931ZE-08	6.1513OE-10	-1.9128ZE-12
5.0000E-00	2.1534OE-07	7.9380IE-10	-2.3637OE-12
1.0000E+01	3.0190ZE-07	6.1151OE-10	-1.65076E-12
2.5000E+01	5.95356E-07	-6.7957ZE-10	2.7015IE-12
5.0000E+01	1.7195IE-06	-2.4184IE-09	6.9951ZE-12
7.5000E+01	2.5389OE-06	-1.9523OE-09	5.6754IE-12
1.0000E+02	3.3832OE-06	-6.3924OE-10	4.7934OE-13
1.2500E+02	5.1588IE-06	1.2246OE-09	-6.3406ZE-12
1.5000E+02	7.9502ZE-06	3.0019OE-09	-1.2852ZE-11
2.0000E+02	1.3230ZE-05	5.2251OE-09	-1.9470ZE-11
2.5000E+02	1.4859OE-05	3.9895IE-09	-1.3433OE-11
3.0000E+02	1.9986IE-05	-5.0906OE-10	4.3508ZE-12
3.5000E+02	3.9440OE-05	-6.7027IE-09	2.8101OE-11
4.0000E+02	6.9724OE-05	-1.2580ZE-08	4.9340OE-11
4.5000E+02	8.9913ZE-05	-1.5316OE-08	5.9283OE-11
5.0000E+02	8.2945ZE-05	-1.3843ZE-08	5.1158IE-11
6.0000E+02	7.9313ZE-05	5.4300ZE-09	-2.2708OE-11
7.0000E+02	2.1022OE-04	2.5420ZE-08	-4.6507OE-11
8.0000E+02	2.9256IE-04	-2.0885ZE-08	8.1509IE-11
9.0000E+02	1.7407OE-02	-2.4000ZE-07	1.0129OE-09
1.0000E+03	1.9664OE-01	-9.3429ZE-07	3.5103IE-09

PRESSURE, ATM	S2DP	S2CP
1.0000E-00	2.0444OE-15	-1.0906ZE-16
2.0000E-00	2.8945ZE-15	-1.5450ZE-18
5.0000E-00	3.5510OE-15	-1.8702ZE-18
1.0000E+01	2.3353IE-15	-1.1984OE-18
2.5000E+01	-4.4410IE-15	2.4725OE-18
5.0000E+01	-1.0722ZE-14	5.1451IE-18
7.5000E+01	-8.06658E-15	4.1137OE-18
1.0000E+02	5.9353ZE-16	-7.5470OE-19
1.2500E+02	1.1613IE-14	-6.8400ZE-18
1.5000E+02	2.1858OE-14	-1.2901ZE-17
2.0000E+02	3.1471IE-14	-1.7503ZE-17
2.5000E+02	2.0181IE-14	-1.0531OE-17
3.0000E+02	-9.9750OE-15	6.5278ZE-18
3.5000E+02	-6.9227ZE-14	2.8462OE-17
4.0000E+02	-8.3584ZE-14	6.7421OE-17
4.5000E+02	-9.8808OE-14	5.9502ZE-17
5.0000E+02	-8.3619OE-14	6.5290OE-17
6.0000E+02	4.0303ZE-14	-2.6522OE-17
7.0000E+02	1.6166OE-13	-9.2025OE-17
8.0000E+02	-1.4102OE-13	8.2152OE-17
9.0000E+02	-1.6969IE-12	9.6798OE-16
1.0000E+03	-5.8471OE-12	3.3190OE-15

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

25 DEGREE C HELIUM ISOTHERM, 298.140 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	2.33524E-09	2.01987E-11	-5.83492E-14
2.000E-00	5.41968E-09	2.93787E-11	-8.37290E-14
5.000E-00	1.29264E-08	3.91001E-11	-1.07028E-13
1.000E+01	1.94971E-08	3.26344E-11	-7.98861E-14
2.500E+01	3.69002E-08	-2.52038E-11	1.03309E-13
5.000E+01	1.03601E-07	-9.89704E-11	3.06943E-13
7.500E+01	1.68215E-07	-1.05711E-10	2.85403E-13
1.000E+02	2.29354E-07	-5.93004E-11	9.72816E-14
1.250E+02	3.23355E-07	1.62962E-11	-1.72721E-13
1.500E+02	4.64366E-07	9.85464E-11	-4.48017E-13
2.000E+02	7.89287E-07	2.15490E-10	-7.92626E-13
2.500E+02	1.01789E-06	2.07121E-10	-6.72370E-13
3.000E+02	1.34002E-06	6.29064E-11	-7.98704E-14
3.500E+02	2.17245E-06	-1.71551E-10	8.01698E-13
4.000E+02	3.52306E-06	-4.16479E-10	1.67750E-12
4.500E+02	4.73099E-06	-5.81269E-10	2.22395E-12
5.000E+02	5.04037E-06	-5.88234E-10	2.17272E-12
6.000E+02	4.62922E-06	-2.49919E-11	-1.71355E-14
7.000E+02	8.01571E-06	7.38424E-10	-2.76670E-12
8.000E+02	1.74024E-05	-5.32887E-10	2.19617E-12
9.000E+02	5.74542E-04	-8.48284E-09	3.17844E-11
1.000E+03	6.20731E-03	-3.08341E-08	1.13905E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	8.36848E-17	-4.28771E-20
2.000E-00	1.19313E-16	-6.08947E-20
5.000E-00	1.49541E-16	-7.54095E-20
1.000E+01	1.05154E-16	-5.10342E-20
2.500E+01	-1.66451E-16	9.05150E-20
5.000E+01	-4.46311E-16	2.29250E-19
7.500E+01	-3.81629E-16	1.84906E-19
1.000E+02	-7.13756E-17	1.32201E-20
1.250E+02	3.50931E-16	-2.13437E-19
1.500E+02	7.66834E-16	-4.31624E-19
2.000E+02	1.24291E-15	-6.64776E-19
2.500E+02	9.68856E-16	-4.86099E-19
3.000E+02	-3.99169E-17	8.59631E-20
3.500E+02	-1.47281E-15	8.74668E-19
4.000E+02	-2.85078E-15	1.61477E-18
4.500E+02	-3.65876E-15	2.02528E-18
5.000E+02	-3.47962E-15	1.88291E-18
6.000E+02	2.18342E-16	-2.26208E-19
7.000E+02	4.57964E-15	-2.58157E-18
8.000E+02	-4.00122E-15	2.45971E-18
9.000E+02	-5.30370E-14	3.02235E-17
1.000E+03	-1.87688E-13	1.05765E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTERNAL PRESSURES - CONTINUED

25 DEGREE C HELIUM ISOTHERM, 298.140 K (77151

PRESSURE, ATM	S2P	S2PP	S2QP
1.0000E-00	2.3352+E-00	2.0100E-11	-5.8349E-14
2.0000E-00	5.4195+E-00	2.0778E-11	-8.3728E-14
5.0000E-00	1.2926+E-00	3.0100E-11	-1.0703E-13
1.0000E+01	1.9497+E-00	3.7434E-11	-7.9861E-14
2.5000E+01	3.6900+E-00	-2.2[illegible]E-11	1.0370E-13
5.0000E+01	1.0360+E-07	-9.4[illegible]E-11	3.7[illegible]E-13
7.5000E+01	1.6821+E-07	-1.0[illegible]E-10	2.0[illegible]E-13
1.0000E+02	2.2935+E-07	-9.[illegible]E-11	9.7281E-14
1.2500E+02	3.2335+E-07	1.[illegible]E-11	-1.7721E-13
1.5000E+02	4.4250+E-07	9.[illegible]E-11	-4.4[illegible]E-13
2.0000E+02	7.8928+E-07	2.1[illegible]E-10	-7.0[illegible]E-13
2.5000E+02	1.0178+E-06	2.0[illegible]E-10	-6.7370E-13
3.0000E+02	1.3400+E-06	6.[illegible]E-11	-7.9870E-14
3.5000E+02	2.1724+E-06	-1.[illegible]E-10	8.0[illegible]E-13
4.0000E+02	3.5290+E-06	-4.[illegible]E-10	1.0770E-12
4.5000E+02	4.7309+E-06	-5.[illegible]E-10	2.2370E-12
5.0000E+02	5.1040+E-06	-2.[illegible]E-10	2.1[illegible]E-12
6.0000E+02	4.6292+E-06	-2.[illegible]E-11	1.7355E-14
7.0000E+02	8.0157+E-06	7.[illegible]E-10	-2.7[illegible]E-12
8.0000E+02	1.7402+E-05	-[illegible]E-10	2.1901E-12
9.0000E+02	5.7[illegible]+E-04	-[illegible]E-10	1.1[illegible]E-11
1.0000E+03	6.2073+E-02	-[illegible]E-08	1.1990E-10

PRESSURE, ATM	S2QP	S2P
1.0000E-00	8.3[illegible]+E-17	[illegible]
2.0000E-00	1.1931+E-16	-6.[illegible]E-20
5.0000E-00	1.4954+E-16	-7.[illegible]E-20
1.0000E+01	1.0515+E-16	-9.1034E-20
2.5000E+01	-1.6[illegible]+E-16	9.0512E-20
5.0000E+01	-4.4[illegible]+E-16	[illegible]
7.5000E+01	-3.8[illegible]+E-16	1.[illegible]E-19
1.0000E+02	-2.1[illegible]+E-17	1.1[illegible]E+20
1.2500E+02	3.5[illegible]+E-16	-2.1[illegible]E-19
1.5000E+02	7.6[illegible]+E-16	-4.[illegible]E-19
2.0000E+02	1.2[illegible]+E-15	-4.[illegible]E-10
2.5000E+02	9.6[illegible]+E-16	-4.[illegible]E-19
3.0000E+02	-5.9[illegible]+E-17	8.[illegible]E-20
3.5000E+02	-1.4[illegible]+E-15	8.[illegible]E-17
4.0000E+02	-2.[illegible]+E-15	1.[illegible]E-18
4.5000E+02	-3.0[illegible]+E-15	2.[illegible]E-18
5.0000E+02	-3.4[illegible]+E-15	1.0[illegible]E-18
6.0000E+02	2.1[illegible]+E-14	-2.[illegible]E-19
7.0000E+02	4.5[illegible]+E-15	-2.[illegible]E-18
8.0000E+02	-4.0[illegible]E-15	2.4[illegible]E-18
9.0000E+02	-5.3[illegible]E-14	3.0[illegible]E-17
1.0000E+03	-1.8[illegible]E-13	1.0[illegible]E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

30 DEGREE C HELIUM ISOTHERM, 303.137 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	8.46053E-08	7.60513E-10	-2.19394E-12
2.000E-00	1.94631E-07	1.10822E-09	-3.16434E-12
5.000E-00	4.52730E-07	1.48251E-09	-4.10601E-12
1.000E+01	6.54146E-07	1.25220E-09	-3.19442E-12
2.500E+01	1.19841E-06	-9.10513E-10	3.53852E-12
5.000E+01	3.55119E-06	-3.72636E-09	1.14742E-11
7.500E+01	5.60543E-06	-4.03213E-09	1.12530E-11
1.000E+02	7.30521E-06	-2.28455E-09	4.67884E-12
1.250E+02	1.03590E-05	6.58833E-10	-5.36298E-12
1.500E+02	1.56914E-05	3.97409E-09	-1.61855E-11
2.000E+02	2.94762E-05	9.18541E-09	-3.21175E-11
2.500E+02	3.72158E-05	1.00398E-08	-3.29498E-11
3.000E+02	3.87324E-05	5.83457E-09	-1.71648E-11
3.500E+02	4.92278E-05	-2.10732E-09	1.01715E-11
4.000E+02	8.14976E-05	-1.11752E-08	3.99418E-11
4.500E+02	1.30973E-04	-1.82610E-08	6.16599E-11
5.000E+02	1.81299E-04	-2.05669E-08	6.62043E-11
6.000E+02	2.66330E-04	-6.06747E-09	1.05439E-11
7.000E+02	2.91224E-04	1.78054E-08	-6.91565E-11
8.000E+02	8.38039E-04	-1.92478E-08	7.80701E-11
9.000E+02	2.18780E-02	-2.66003E-07	9.72393E-10
1.000E+03	2.07790E-01	-9.67648E-07	3.46284E-09

PRESSURE, ATM	S2DP	S2EP
1.000E-00	3.10562E-15	-1.56911E-18
2.000E-00	4.45822E-15	-2.24606E-18
5.000E-00	5.70384E-15	-2.84895E-18
1.000E+01	4.26253E-15	-2.07619E-18
2.500E+01	-5.52523E-15	2.93546E-18
5.000E+01	-1.64709E-14	8.34688E-18
7.500E+01	-1.52849E-14	7.45775E-18
1.000E+02	-4.90509E-15	1.88616E-18
1.250E+02	1.02774E-14	-6.04742E-18
1.500E+02	2.62441E-14	-1.42461E-17
2.000E+02	4.86942E-14	-2.53530E-17
2.500E+02	4.79072E-14	-2.41398E-17
3.000E+02	2.24891E-14	-1.02694E-17
3.500E+02	-1.91077E-14	1.14561E-17
4.000E+02	-6.25502E-14	3.32528E-17
4.500E+02	-9.18035E-14	4.66202E-17
5.000E+02	-9.33793E-14	4.46406E-17
6.000E+02	2.21408E-15	-1.13272E-17
7.000E+02	1.20532E-13	-7.15064E-17
8.000E+02	-1.48307E-13	9.59088E-17
9.000E+02	-1.63786E-12	9.54590E-16
1.000E+03	-5.69679E-12	3.24892E-15

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

30 DEGREE C HELIUM ISOTHERM, 303.137 K (ITS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.0000E-00	8.4605[illegible]E-08	7.4051[illegible]E-10	-2.1939[illegible]E-12
2.0000E-00	1.9463[illegible]E-07	1.2022[illegible]E-09	-3.1643[illegible]E-12
5.0000E-00	4.5273[illegible]E-07	1.4825[illegible]E-09	-4.1060[illegible]E-12
1.0000E+01	6.5413[illegible]E-07	1.2512[illegible]E-09	-3.1994[illegible]E-12
2.5000E+01	1.1984[illegible]E-06	-9.1051[illegible]E-10	3.5385[illegible]E-12
5.0000E+01	3.5511[illegible]E-06	-3.7243[illegible]E-09	1.1474[illegible]E-11
7.5000E+01	5.6054[illegible]E-06	-4.0221[illegible]E-09	1.1253[illegible]E-11
1.0000E+02	7.3052[illegible]E-06	-2.2945[illegible]E-09	4.0780[illegible]E-12
1.2500E+02	1.0359[illegible]E-05	5.5[illegible]E-10	-5.3629[illegible]E-12
1.5000E+02	1.5691[illegible]E-05	3.0740[illegible]E-09	-1.6185[illegible]E-11
2.0000E+02	2.9478[illegible]E-05	9.1854[illegible]E-09	-3.2117[illegible]E-11
2.5000E+02	3.7215[illegible]E-05	1.0079[illegible]E-05	-3.2959[illegible]E-11
3.0000E+02	3.8732[illegible]E-05	5.8945[illegible]E-09	-1.7164[illegible]E-11
3.5000E+02	4.9227[illegible]E-05	-2.1072[illegible]E-09	1.0171[illegible]E-11
4.0000E+02	8.1497[illegible]E-05	-1.1175[illegible]E-08	3.9941[illegible]E-11
4.5000E+02	1.3097[illegible]E-04	-1.3261[illegible]E-08	6.1659[illegible]E-11
5.0000E+02	1.8129[illegible]E-04	[illegible]	6.8204[illegible]E-11
6.0000E+02	2.6639[illegible]E-04	-6.0[illegible]74[illegible]E-09	1.0594[illegible]E-11
7.0000E+02	2.9122[illegible]E-04	1.7805[illegible]E-08	-6.9154[illegible]E-11
8.0000E+02	8.3803[illegible]E-04	-1.0924[illegible]E-08	7.8070[illegible]E-11
9.0000E+02	2.1878[illegible]E-02	-2.4600[illegible]E-07	9.7229[illegible]E-10
1.0000E+03	2.0771[illegible]E-01	-9.5[illegible]4[illegible]E-07	3.4[illegible]28[illegible]E-09

PRESSURE, ATM	S2DP	S2EP
1.0000E-00	3.1055[illegible]E-15	-1.5491[illegible]E-18
2.0000E-00	4.5822[illegible]E-15	-2.2[illegible]0[illegible]E-18
5.0000E-00	5.7038[illegible]E-15	-2.8[illegible]9[illegible]E-18
1.0000E+01	4.2625[illegible]E-15	-2.0[illegible]1[illegible]E-18
2.5000E+01	-5.5252[illegible]E-15	2.9[illegible]0[illegible]E-18
5.0000E+01	-1.6470[illegible]E-14	8.3[illegible]8[illegible]E-18
7.5000E+01	-1.5284[illegible]E-14	1.4[illegible]7[illegible]E-18
1.0000E+02	-4.9030[illegible]E-15	1.5861[illegible]E-18
1.2500E+02	1.0277[illegible]E-14	-6.0[illegible]7[illegible]E-18
1.5000E+02	2.6244[illegible]E-14	-1.4[illegible]6[illegible]E-17
2.0000E+02	4.8694[illegible]E-14	-2.5[illegible]30E-17
2.5000E+02	4.7001[illegible]E-14	-2.4[illegible]0[illegible]E-17
3.0000E+02	2.2409[illegible]E-14	-1.0[illegible]6[illegible]E-17
3.5000E+02	-1.9107[illegible]E-14	1.1[illegible]5[illegible]E-17
4.0000E+02	-6.2550[illegible]E-14	3.4[illegible]8[illegible]E-17
4.5000E+02	-9.1803[illegible]E-14	4.5[illegible]0[illegible]E-17
5.0000E+02	-9.3370[illegible]E-14	4.4[illegible]0[illegible]E-17
6.0000E+02	2.2140[illegible]E-15	-1.1[illegible]7[illegible]E-17
7.0000E+02	1.2053[illegible]E-13	-7.1[illegible]0[illegible]E-17
8.0000E+02	-1.4830[illegible]E-13	9.5[illegible]0[illegible]E-17
9.0000E+02	-1.6376[illegible]E-12	9.5[illegible]0[illegible]E-16
1.0000E+03	-5.6[illegible]4[illegible]E-12	3.2[illegible]9[illegible]E-15

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	3.81936E-09	3.75212E-11	-1.17767E-13
2.000E-00	8.68006E-09	5.41058E-11	-1.67828E-13
5.000E-00	1.97093E-08	7.02556E-11	-2.10192E-13
1.000E+01	2.80037E-08	5.50796E-11	-1.48001E-13
2.500E+01	5.43895E-08	-5.66733E-11	2.29110E-13
5.000E+01	1.56508E-07	-1.83868E-10	6.07119E-13
7.500E+01	2.36689E-07	-1.74854E-10	5.03511E-13
1.000E+02	3.16250E-07	-6.61646E-11	6.78593E-14
1.250E+02	4.68575E-07	8.96241E-11	-5.06390E-13
1.500E+02	7.02802E-07	2.45541E-10	-1.05134E-12
2.000E+02	1.16370E-06	4.25280E-10	-1.59354E-12
2.500E+02	1.39060E-06	3.24340E-10	-1.06875E-12
3.000E+02	1.95167E-06	-4.14037E-11	4.13081E-13
3.500E+02	3.54726E-06	-5.36481E-10	2.31406E-12
4.000E+02	5.60742E-06	-9.58834E-10	3.86619E-12
4.500E+02	6.39885E-06	-1.09536E-09	4.27726E-12
5.000E+02	5.27430E-06	-7.78221E-10	2.93879E-12
6.000E+02	1.20854E-05	1.32570E-09	-5.25922E-12
7.000E+02	4.30174E-05	3.66942E-09	-1.40932E-11
8.000E+02	1.08774E-05	3.19069E-10	-9.86286E-13
9.000E+02	1.20591E-03	-2.05756E-08	7.87161E-11
1.000E+03	1.60815E-02	-7.83362E-08	2.97465E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	1.79414E-16	-9.60603E-20
2.000E-00	2.54307E-16	-1.35742E-19
5.000E-00	3.13200E-16	-1.65576E-19
1.000E+01	2.08899E-16	-1.06910E-19
2.500E+01	-3.80229E-16	2.12393E-19
5.000E+01	-9.31610E-16	4.98718E-19
7.500E+01	-7.11911E-16	3.61043E-19
1.000E+02	2.27073E-17	-5.41955E-20
1.250E+02	9.55220E-16	-5.70065E-19
1.500E+02	1.81437E-15	-1.03646E-18
2.000E+02	2.58189E-15	-1.42084E-18
2.500E+02	1.57232E-15	-8.04549E-19
3.000E+02	-9.85391E-16	6.67058E-19
3.500E+02	-4.16914E-15	2.46428E-18
4.000E+02	-6.69236E-15	3.85848E-18
4.500E+02	-7.24496E-15	4.11394E-18
5.000E+02	-4.83725E-15	2.68135E-18
6.000E+02	9.16259E-15	-5.35910E-18
7.000E+02	2.38847E-14	-1.36606E-17
8.000E+02	1.30436E-15	-5.68578E-19
9.000E+02	-1.33332E-13	7.63128E-17
1.000E+03	-5.00943E-13	2.85418E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.0000E-00	3.8193E-09	3.7521E-11	-1.1775E-13
2.0000E-00	8.6800E-09	5.4105E-11	-1.6782E-13
5.0000E-00	1.9709E-08	7.0239E-11	-2.1019E-13
1.0000E+01	2.8003E-08	5.5706E-11	-1.4800E-13
2.5000E+01	5.4395E-08	-5.6173E-11	2.2911E-13
5.0000E+01	1.5650E-07	-1.8326E-10	6.0711E-13
7.5000E+01	2.3648E-07	-1.7885E-10	5.0351E-13
1.0000E+02	3.1625E-07	-6.6146E-11	8.7897E-14
1.2500E+02	4.6857E-07	8.3634E-11	-5.0070E-13
1.5000E+02	7.0280E-07	2.4954E-10	-1.0513E-12
2.0000E+02	1.1637E-06	6.2290E-10	-1.5595E-12
2.5000E+02	1.1966E-06	3.2430E-10	-1.0687E-12
3.0000E+02	1.9516E-06	-6.1403E-11	4.1301E-13
3.5000E+02	3.5472E-06	-4.3047E-10	2.3146E-12
4.0000E+02	5.6074E-06	-9.5863E-10	3.8661E-12
4.5000E+02	6.3988E-06	-1.0053E-09	4.2172E-12
5.0000E+02	5.2746E-06	-7.7822E-10	2.9387E-12
6.0000E+02	1.2085E-06	1.3257E-09	-5.2592E-12
7.0000E+02	4.3017E-05	3.8424E-09	-1.4093E-11
8.0000E+02	1.0277E-05	3.1700E-10	-9.8628E-13
9.0000E+02	1.2059E-03	-2.0515E-08	7.8716E-11
1.0000E+03	1.6081E-02	-7.8382E-08	2.9766E-10

PRESSURE, ATM	S2DP	S2EP
1.0000E-00	1.7912E-16	-9.6000E-20
2.0000E-00	2.5430E-16	-1.3572E-19
5.0000E-00	3.1328E-16	-1.4557E-19
1.0000E+01	2.0899E-16	-1.0490E-19
2.5000E+01	-3.8022E-16	2.1230E-19
5.0000E+01	-9.3161E-16	6.9021E-19
7.5000E+01	-7.1191E-16	5.6109E-19
1.0000E+02	2.2701E-17	-5.1953E-20
1.2500E+02	9.5525E-16	-5.7065E-19
1.5000E+02	1.8143E-15	-1.0594E-18
2.0000E+02	2.5819E-15	-1.4208E-18
2.5000E+02	1.5123E-15	-6.0434E-19
3.0000E+02	-9.8539E-16	6.4105E-19
3.5000E+02	-4.1491E-15	2.4842E-18
4.0000E+02	-6.9236E-15	3.8584E-18
4.5000E+02	-1.2496E-15	4.1394E-18
5.0000E+02	-4.8372E-15	3.0813E-18
6.0000E+02	9.1625E-15	-6.3501E-18
7.0000E+02	2.3846E-14	-1.3465E-17
8.0000E+02	1.3046E-15	-5.6516E-19
9.0000E+02	-1.3323E-13	7.6312E-17
1.0000E+03	-5.0044E-13	2.8941E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	3.65094E-09	3.61623E-11	-1.13192E-13
2.000E-00	8.27844E-09	5.21526E-11	-1.61451E-13
5.000E-00	1.86743E-08	6.77300E-11	-2.02705E-13
1.000E+01	2.62364E-08	5.30815E-11	-1.43659E-13
2.500E+01	5.06777E-08	-5.49445E-11	2.18904E-13
5.000E+01	1.46646E-07	-1.78121E-10	5.87078E-13
7.500E+01	2.17507E-07	-1.68944E-10	4.91533E-13
1.000E+02	2.86614E-07	-6.18363E-11	7.03239E-14
1.250E+02	4.31171E-07	9.27795E-11	-4.93697E-13
1.500E+02	6.63222E-07	2.49408E-10	-1.03977E-12
2.000E+02	1.11998E-06	4.38150E-10	-1.62803E-12
2.500E+02	1.26527E-06	3.52247E-10	-1.19047E-12
3.000E+02	1.63348E-06	-5.28052E-12	2.19989E-13
3.500E+02	3.13272E-06	-5.17588E-10	2.14852E-12
4.000E+02	5.58395E-06	-1.00308E-09	3.91830E-12
4.500E+02	7.36604E-06	-1.26700E-09	4.81825E-12
5.000E+02	7.00950E-06	-1.15368E-09	4.29299E-12
6.000E+02	6.16798E-06	3.18284E-10	-1.33969E-12
7.000E+02	1.49699E-05	1.89980E-09	-7.14600E-12
8.000E+02	2.57605E-05	-1.83500E-09	7.10887E-12
9.000E+02	1.41681E-03	-2.17808E-08	8.16916E-11
1.000E+03	1.56442E-02	-7.57513E-08	2.82143E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	1.70807E-16	-9.09708E-20
2.000E-00	2.42436E-16	-1.28759E-19
5.000E-00	2.99760E-16	-1.57813E-19
1.000E+01	2.02254E-16	-1.03410E-19
2.500E+01	-3.58230E-16	1.98663E-19
5.000E+01	-8.94038E-16	4.76805E-19
7.500E+01	-6.96905E-16	3.54708E-19
1.000E+02	1.23096E-18	-3.63681E-20
1.250E+02	9.05551E-16	-5.33345E-19
1.500E+02	1.76011E-15	-9.95737E-19
2.000E+02	2.61313E-15	-1.43233E-18
2.500E+02	1.78844E-15	-9.33743E-19
3.000E+02	-5.89750E-16	4.16912E-19
3.500E+02	-3.75664E-15	2.18453E-18
4.000E+02	-6.60032E-15	3.74601E-18
4.500E+02	-7.96718E-15	4.46057E-18
5.000E+02	-6.97043E-15	3.84164E-18
6.000E+02	2.48217E-15	-1.54434E-18
7.000E+02	1.18901E-14	-6.74558E-18
8.000E+02	-1.22077E-14	7.13248E-18
9.000E+02	-1.35996E-13	7.72944E-17
1.000E+03	-4.66883E-13	2.63982E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (ITS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.0000E-00	3.6509+E-09	3.6348E-11	-1.1319E-13
2.0000E-00	8.2784+E-09	5.2125E-11	-1.6145E-13
5.0000E-00	1.8674E-08	6.7730E-11	-2.0270E-13
1.0000E+01	2.6236+E-08	5.3015E-11	-1.4365E-13
2.5000E+01	5.0677E-08	-5.4044E-11	2.1890E-13
5.0000E+01	1.4664E-07	-1.7912E-10	5.8707E-13
7.5000E+01	2.1750E-07	-1.8894E-10	4.9193E-13
1.0000E+02	2.8661E-07	-4.1813E-11	7.0323E-14
1.2500E+02	4.3171E-07	9.2729E-11	-4.9369E-13
1.5000E+02	6.4322E-07	2.4954E-10	-1.0397E-12
2.0000E+02	1.1098E-06	4.3815E-10	-1.6280E-12
2.5000E+02	1.2652E-06	3.5224E-10	-1.1984E-12
3.0000E+02	1.6324E-06	-2.2009E-12	2.1994E-13
3.5000E+02	3.1272E-06	-5.1758E-10	2.1485E-12
4.0000E+02	5.5395E-06	-1.0728E-09	3.9183E-12
4.5000E+02	7.3646E-06	-1.2474E-09	4.8125E-12
5.0000E+02	7.0950E-06	-1.1548E-09	4.2994E-12
6.0000E+02	6.1679E-06	5.1286E-10	-1.3390E-12
7.0000E+02	1.4579E-05	1.8095E-09	-7.1400E-12
8.0000E+02	2.5740E-05	-1.8350E-09	7.1088E-12
9.0000E+02	1.4138E-03	-2.1708E-08	8.1692E-11
1.0000E+03	1.5844E-02	-7.3713E-08	2.8214E-10

PRESSURE, ATM	S3DP	S3FP
1.0000E-00	1.7080E-14	-4.0070E-20
2.0000E-00	2.4234E-14	-1.2075E-15
5.0000E-00	2.9716E-14	-1.5181E-10
1.0000E+01	2.0225E-14	-1.8342E-19
2.5000E+01	-3.5831E-15	1.9806E-19
5.0000E+01	-8.9403E-16	4.7000E-19
7.5000E+01	-6.9705E-16	3.7470E-19
1.0000E+02	1.2389E-14	3.5184E-20
1.2500E+02	9.0558E-16	-5.2324E-19
1.5000E+02	1.7401E-15	-9.0575E-19
2.0000E+02	2.6131E-15	-1.4324E-18
2.5000E+02	1.7484E-15	-9.3374E-19
3.0000E+02	-5.8972E-16	4.1071E-19
3.5000E+02	-3.7564E-15	2.1845E-18
4.0000E+02	-6.6032E-15	3.7480E-18
4.5000E+02	-7.9471E-15	4.4885E-18
5.0000E+02	-6.9704E-15	3.8416E-18
6.0000E+02	2.4821E-15	-1.5496E-18
7.0000E+02	1.1870E-14	-6.7455E-18
8.0000E+02	-1.2207E-14	7.1324E-18
9.0000E+02	-1.3599E-13	7.1294E-17
1.0000E+03	-4.6888E-13	2.6795E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

60 DEGREE C HELIUM ISOTHERM, 333.136 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	1.16111E-09	1.12259E-11	-3.45709E-14
2.000E-00	2.64244E-09	1.62311E-11	-4.94436E-14
5.000E-00	6.00624E-09	2.12348E-11	-6.25825E-14
1.000E+01	8.48928E-09	1.69660E-11	-4.54281E-14
2.500E+01	1.60740E-08	-1.61757E-11	6.41852E-14
5.000E+01	4.66024E-08	-5.51809E-11	1.79497E-13
7.500E+01	6.98074E-08	-5.40344E-11	1.56139E-13
1.000E+02	9.11029E-08	-2.25050E-11	3.31234E-14
1.250E+02	1.34706E-07	2.44198E-11	-1.35957E-13
1.500E+02	2.06391E-07	7.30222E-11	-3.03343E-13
2.000E+02	3.55664E-07	1.35197E-10	-4.96876E-13
2.500E+02	4.08431E-07	1.15895E-10	-3.89823E-13
3.000E+02	5.05651E-07	1.30443E-11	1.26426E-14
3.500E+02	9.33589E-07	-1.41006E-10	5.85596E-13
4.000E+02	1.68653E-06	-2.93519E-10	1.13502E-12
4.500E+02	2.30555E-06	-3.86175E-10	1.45090E-12
5.000E+02	2.29336E-06	-3.70127E-10	1.36103E-12
6.000E+02	1.84158E-06	4.57255E-11	-2.13159E-13
7.000E+02	4.86579E-06	5.85188E-10	-2.17463E-12
8.000E+02	4.20106E-06	-2.21730E-10	8.80797E-13
9.000E+02	2.95060E-04	-5.39646E-09	1.99522E-11
1.000E+03	3.61454E-03	-1.99301E-08	7.31218E-11

PRESSURE, ATM	S2DP	S2EP
1.000E-00	5.13103E-17	-2.68850E-20
2.000E-00	7.30286E-17	-3.81590E-20
5.000E-00	9.10575E-17	-4.71717E-20
1.000E+01	6.30755E-17	-3.17794E-20
2.500E+01	-1.03720E-16	5.66990E-20
5.000E+01	-2.69273E-16	1.41411E-19
7.500E+01	-2.19026E-16	1.10117E-19
1.000E+02	-1.77581E-17	-1.02202E-21
1.250E+02	2.49437E-16	-1.45666E-19
1.500E+02	5.07696E-16	-2.83361E-19
2.000E+02	7.86826E-16	-4.25131E-19
2.500E+02	5.81329E-16	-3.00749E-19
3.000E+02	-8.91856E-17	7.49635E-20
3.500E+02	-1.01716E-15	5.85512E-19
4.000E+02	-1.88846E-15	1.05747E-18
4.500E+02	-2.36733E-15	1.30711E-18
5.000E+02	-2.18242E-15	1.18757E-18
6.000E+02	4.26861E-16	-2.79723E-19
7.000E+02	3.57330E-15	-2.00142E-18
8.000E+02	-1.54591E-15	9.17754E-19
9.000E+02	-3.27288E-14	1.83265E-17
1.000E+03	-1.19141E-13	6.63261E-17

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

70 DEGREE C HELIUM ISOTHERM, 343.136 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	3.44284E-09	3.50846E-11	-1.13312E-13
2.000E-00	7.77585E-09	5.04491E-11	-1.61100E-13
5.000E-00	1.74000E-08	6.49639E-11	-2.00330E-13
1.000E+01	2.43056E-08	4.97984E-11	-1.38002E-13
2.500E+01	4.79091E-08	-5.59983E-11	2.27622E-13
5.000E+01	1.37727E-07	-1.71682E-10	5.80951E-13
7.500E+01	2.02847E-07	-1.56170E-10	4.60916E-13
1.000E+02	2.71542E-07	-4.69481E-11	2.09953E-14
1.250E+02	4.14002E-07	1.04361E-10	-5.45856E-13
1.500E+02	6.32209E-07	2.52302E-10	-1.07408E-12
2.000E+02	1.02803E-06	4.12075E-10	-1.56809E-12
2.500E+02	1.16155E-06	2.95089E-10	-9.98348E-13
3.000E+02	1.63222E-06	-7.58600E-11	5.04760E-13
3.500E+02	3.15533E-06	-5.65050E-10	2.39995E-12
4.000E+02	5.20482E-06	-9.78519E-10	3.94222E-12
4.500E+02	6.13849E-06	-1.12113E-09	4.39776E-12
5.000E+02	5.20659E-06	-8.54375E-10	3.26103E-12
6.000E+02	7.46190E-06	8.32100E-10	-3.37101E-12
7.000E+02	1.36914E-05	1.87372E-09	-7.24381E-12
8.000E+02	8.15071E-05	-4.47296E-09	1.76161E-11
9.000E+02	2.79554E-03	-3.11897E-08	1.20817E-10
1.000E+03	2.63699E-02	-9.90339E-08	3.81349E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	1.76302E-16	-9.69467E-20
2.000E-00	2.49376E-16	-1.36727E-19
5.000E-00	3.05142E-16	-1.65758E-19
1.000E+01	1.99258E-16	-1.04821E-19
2.500E+01	-3.83175E-16	2.19151E-19
5.000E+01	-9.09886E-16	5.00163E-19
7.500E+01	-6.65376E-16	3.46436E-19
1.000E+02	8.50915E-17	-8.71966E-20
1.250E+02	1.02055E-15	-6.17360E-19
1.500E+02	1.86919E-15	-1.08998E-18
2.000E+02	2.58402E-15	-1.45768E-18
2.500E+02	1.50567E-15	-7.93626E-19
3.000E+02	-1.10477E-15	7.36061E-19
3.500E+02	-4.31101E-15	2.58228E-18
4.000E+02	-6.85072E-15	4.01467E-18
4.500E+02	-7.49682E-15	4.32982E-18
5.000E+02	-5.42191E-15	3.06131E-18
6.000E+02	6.02250E-15	-3.65231E-18
7.000E+02	1.23703E-14	-7.20718E-18
8.000E+02	-3.07128E-14	1.82504E-17
9.000E+02	-2.07461E-13	1.21653E-16
1.000E+03	-6.51627E-13	3.80544E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

70 DEGREE C HELIUM ISOTHERM, 343.136 K (171)

PRESSURE, ATM	S2P	S2EP	S2CP
1.0000E-00	3.4424E-09	7.5084E-11	-1.1312E-13
2.0000E-00	7.7758E-09	5.0469E-11	-1.6110E-13
5.0000E-00	1.7400E-08	6.4934E-11	-2.0230E-13
1.0000E+01	2.4305E-08	4.0108E-11	-1.3600E-13
2.5000E+01	4.7909E-08	-5.5904E-11	2.2762E-13
5.0000E+01	1.3772E-07	-1.7448E-10	5.8095E-13
7.5000E+01	2.0284E-07	-1.5617E-10	4.6391E-13
1.0000E+02	2.7154E-07	-4.4947E-11	2.0995E-14
1.2500E+02	4.1400E-07	1.0934E-10	-5.4585E-13
1.5000E+02	6.3220E-07	2.5270E-10	-1.0740E-12
2.0000E+02	1.0280E-06	4.1272E-10	-1.5609E-12
2.5000E+02	1.1615E-06	2.4500E-10	-9.9349E-13
3.0000E+02	1.6322E-06	-1.5800E-11	5.0476E-13
3.5000E+02	3.1535E-06	-5.4505E-10	2.3095E-12
4.0000E+02	5.2048E-06	-9.7851E-10	3.9422E-12
4.5000E+02	6.1384E-06	-1.1111E-09	4.3977E-12
5.0000E+02	5.2068E-06	-9.3475E-10	3.2410E-12
6.0000E+02	7.4618E-06	8.5210E-10	-3.3710E-12
7.0000E+02	1.3691E-05	1.8737E-09	-7.2438E-12
8.0000E+02	8.1507E-05	-4.4729E-09	1.7616E-11
9.0000E+02	2.7955E-03	-3.1389E-08	1.2081E-10
1.0000E+03	2.6369E-02	-9.3835E-08	3.6134E-10

PRESSURE, ATM	S2DP	S2EP	S2CP
1.0000E-00	1.7630E-16	-9.8946E-20	
2.0000E-00	2.4937E-16	-1.3872E-19	
5.0000E-00	3.0514E-16	-1.6572E-19	
1.0000E+01	1.9925E-16	-1.0402E-19	
2.5000E+01	-3.8317E-16	2.1515E-19	
5.0000E+01	-9.0984E-16	5.0016E-19	
7.5000E+01	-6.6537E-16	3.4843E-19	
1.0000E+02	8.5891E-17	-9.7106E-20	
1.2500E+02	1.0205E-15	-6.1736E-19	
1.5000E+02	1.8691E-15	-1.0490E-18	
2.0000E+02	2.5840E-15	-1.4570E-18	
2.5000E+02	1.5056E-15	-7.0361E-19	
3.0000E+02	-1.1047E-15	7.3604E-19	
3.5000E+02	-9.3110E-15	2.5222E-18	
4.0000E+02	-6.8507E-15	4.0246E-18	
4.5000E+02	-7.4968E-15	4.2908E-18	
5.0000E+02	-5.4219E-15	3.0013E-18	
6.0000E+02	6.0225E-15	-3.4923E-18	
7.0000E+02	1.2370E-14	-7.1091E-18	
8.0000E+02	-3.0712E-14	1.8250E-17	
9.0000E+02	-2.0746E-13	1.2165E-16	
1.0000E+03	-6.5162E-13	3.8054E-16	

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES - CONTINUED

80 DEGREE C HELIUM ISOTHERM, 353.138 K (TTS)

PRESSURE, ATM	S2P	S2BP	S2CP
1.000E-00	5.26742E-09	5.29368E-11	-1.69267E-13
2.000E-00	1.19204E-08	7.62444E-11	-2.41099E-13
5.000E-00	2.67771E-08	9.86493E-11	-3.01481E-13
1.000E+01	3.74775E-08	7.65899E-11	-2.11233E-13
2.500E+01	7.28601E-08	-8.19722E-11	3.31623E-13
5.000E+01	2.10027E-07	-2.59008E-10	8.69522E-13
7.500E+01	3.10234E-07	-2.40579E-10	7.08969E-13
1.000E+02	4.11584E-07	-8.02981E-11	6.81511E-14
1.250E+02	6.22509E-07	1.45976E-10	-7.72253E-13
1.500E+02	9.52612E-07	3.70772E-10	-1.56899E-12
2.000E+02	1.57379E-06	6.26276E-10	-2.36547E-12
2.500E+02	1.77593E-06	4.73834E-10	-1.60891E-12
3.000E+02	2.39749E-06	-6.42780E-11	5.53026E-13
3.500E+02	4.59854E-06	-7.97914E-10	3.36812E-12
4.000E+02	7.80148E-06	-1.44722E-09	5.77242E-12
4.500E+02	9.60560E-06	-1.72447E-09	6.69484E-12
5.000E+02	8.51094E-06	-1.41693E-09	5.36515E-12
6.000E+02	9.88825E-06	9.30793E-10	-3.78254E-12
7.000E+02	1.93366E-05	2.65943E-09	-1.01815E-11
8.000E+02	9.40511E-05	-5.59406E-09	2.18393E-11
9.000E+02	3.47863E-03	-4.20967E-08	1.61303E-10
1.000E+03	3.38799E-02	-1.36312E-07	5.19064E-10

PRESSURE, ATM	S2DP	S2EP
1.000E-00	2.60438E-16	-1.41723E-19
2.000E-00	3.69098E-16	-2.00276E-19
5.000E-00	4.54329E-16	-2.44299E-19
1.000E+01	3.02452E-16	-1.57724E-19
2.500E+01	-5.53016E-16	3.13287E-19
5.000E+01	-1.34837E-15	7.34066E-19
7.500E+01	-1.01816E-15	5.26834E-19
1.000E+02	6.41368E-17	-9.24844E-20
1.250E+02	1.43686E-15	-8.62850E-19
1.500E+02	2.70505E-15	-1.56271E-18
2.000E+02	3.86242E-15	-2.15932E-18
2.500E+02	2.43003E-15	-1.28090E-18
3.000E+02	-1.28624E-15	8.75586E-19
3.500E+02	-5.99811E-15	3.56172E-18
4.000E+02	-9.92272E-15	5.75643E-18
4.500E+02	-1.12887E-14	6.45469E-18
5.000E+02	-8.84732E-15	4.95882E-18
6.000E+02	6.78175E-15	-4.12632E-18
7.000E+02	1.72169E-14	-9.94368E-18
8.000E+02	-3.77520E-14	2.22678E-17
9.000E+02	-2.73987E-13	1.59124E-16
1.000E+03	-8.77036E-13	5.07083E-16

TABLE 6. - VARIANCES AND COVARIANCES FOR INTEGRAL PRESSURES
- CONTINUED

80 DEGREE C NEUTRON ISOTHERM, 152.138 K (ITS)

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES

-5 DEGREE C HELIUM ISOTHERM, 268.153 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0005449893E-00	9.37316E-07
2.000E-00	1.0010898411E-00	1.84873E-06
5.000E-00	1.0027235733E-00	4.51436E-06
1.000E+01	1.0054437242E-00	8.79566E-06
2.500E+01	1.0135838167E-00	2.06965E-05
5.000E+01	1.0270838072E-00	3.78669E-05
7.500E+01	1.0405020888E-00	5.21440E-05
1.000E+02	1.0538407100E-00	6.39083E-05
1.250E+02	1.0671016502E-00	7.34993E-05
1.500E+02	1.0802868200E-00	8.12343E-05
2.000E+02	1.1064371457E-00	9.23130E-05
2.500E+02	1.1323055926E-00	9.93065E-05
3.000E+02	1.1579049628E-00	1.04043E-04
3.500E+02	1.1832469555E-00	1.07992E-04
4.000E+02	1.2083421669E-00	1.12257E-04
4.500E+02	1.2332000900E-00	1.17579E-04
5.000E+02	1.2578291146E-00	1.24325E-04
6.000E+02	1.3064285125E-00	1.41257E-04
7.000E+02	1.3541854177E-00	1.55653E-04
8.000E+02	1.4011272379E-00	1.51066E-04
9.000E+02	1.4472637310E-00	1.16454E-04
1.000E+03	1.4925870054E-00	1.74749E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

10 DEGREE C HELIUM ISOTHERM, 283.146 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0005130810E-00	4.78477E-07
2.000E-00	1.0010260372E-00	9.44233E-07
5.000E-00	1.0025641590E-00	2.30709E-06
1.000E+01	1.0051252117E-00	4.49641E-06
2.500E+01	1.0127898744E-00	1.05792E-05
5.000E+01	1.0255035060E-00	1.93409E-05
7.500E+01	1.0381426273E-00	2.66090E-05
1.000E+02	1.0507089246E-00	3.25846E-05
1.250E+02	1.0632040378E-00	3.74472E-05
1.500E+02	1.0756295604E-00	4.13641E-05
2.000E+02	1.1002779768E-00	4.69782E-05
2.500E+02	1.1246659960E-00	5.05526E-05
3.000E+02	1.1488046990E-00	5.30286E-05
3.500E+02	1.1727044255E-00	5.51541E-05
4.000E+02	1.1963747744E-00	5.74879E-05
4.500E+02	1.2198246029E-00	6.04064E-05
5.000E+02	1.2430620275E-00	6.40919E-05
6.000E+02	1.2889284236E-00	7.32703E-05
7.000E+02	1.3340240691E-00	8.09463E-05
8.000E+02	1.3783872113E-00	7.82237E-05
9.000E+02	1.4220442387E-00	5.95207E-05
1.000E+03	1.4650096806E-00	9.36709E-05

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

20 DEGREE C HELIUM ISOTHERM, 293.139 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004966970E-00	2.51632E-06
2.000E-00	1.0009932632E-00	4.96677E-06
5.000E-00	1.0024821780E-00	1.21403E-05
1.000E+01	1.0049610994E-00	2.36728E-05
2.500E+01	1.0123785123E-00	5.57697E-05
5.000E+01	1.0246774812E-00	1.02161E-04
7.500E+01	1.0368991907E-00	1.40819E-04
1.000E+02	1.0490458521E-00	1.72752E-04
1.250E+02	1.0611196033E-00	1.98860E-04
1.500E+02	1.0731225090E-00	2.19983E-04
2.000E+02	1.0969236772E-00	2.50382E-04
2.500E+02	1.1204644112E-00	2.69653E-04
3.000E+02	1.1437585947E-00	2.82621E-04
3.500E+02	1.1668189403E-00	2.93165E-04
4.000E+02	1.1896569901E-00	3.04219E-04
4.500E+02	1.2122831151E-00	3.17785E-04
5.000E+02	1.2347065155E-00	3.34908E-04
6.000E+02	1.2789760891E-00	3.78296E-04
7.000E+02	1.3225158953E-00	4.17128E-04
8.000E+02	1.3653573849E-00	4.11129E-04
9.000E+02	1.4075132749E-00	3.25438E-04
1.000E+03	1.4489775486E-00	4.12289E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

25 DEGREE C HELIUM ISOTHERM, 298.140 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004844818E-00	5.20649E-07
2.000E-00	1.0009688493E-00	1.02735E-06
5.000E-00	1.0024212666E-00	2.51093E-06
1.000E+01	1.0048396844E-00	4.89840E-06
2.500E+01	1.0120779713E-00	1.15666E-05
5.000E+01	1.0240859764E-00	2.12876E-05
7.500E+01	1.0360255518E-00	2.94941E-05
1.000E+02	1.0478981939E-00	3.63789E-05
1.250E+02	1.0597053589E-00	4.21124E-05
1.500E+02	1.0714484630E-00	4.68522E-05
2.000E+02	1.0947479525E-00	5.39325E-05
2.500E+02	1.1178071893E-00	5.86853E-05
3.000E+02	1.1406360585E-00	6.20125E-05
3.500E+02	1.1632438032E-00	6.46458E-05
4.000E+02	1.1856390249E-00	6.71492E-05
4.500E+02	1.2078296830E-00	6.99278E-05
5.000E+02	1.2298230953E-00	7.32265E-05
6.000E+02	1.2732442435E-00	8.14231E-05
7.000E+02	1.3159481741E-00	8.94299E-05
8.000E+02	1.3579703216E-00	9.10630E-05
9.000E+02	1.3993358514E-00	8.09972E-05
1.000E+03	1.4400596590E-00	8.97801E-05

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS
FOR INTEGRAL PRESSURES - CONTINUED

25 DEGREE C HELIUM ISOTHERM, 298.150 K (TTS)

PRESSURE, ATM	Z	SZ
1.0000E-00	1.0000E+00	5.2064E-07
2.0000E-00	1.0079E+00	1.4273E-06
5.0000E-00	1.0274E+00	2.5109E-06
1.0000E+01	1.0548E+00	4.8084E-06
2.5000E+01	1.0120E+00	1.1584E-05
5.0000E+01	1.0240E+00	2.1287E-05
7.5000E+01	1.0360E+00	2.9091E-05
1.0000E+02	1.0479E+00	3.6378E-05
1.2500E+02	1.0599E+00	4.2112E-05
1.5000E+02	1.0718E+00	4.8572E-05
2.0000E+02	1.0956E+00	5.1932E-05
2.5000E+02	1.1195E+00	5.8805E-05
3.0000E+02	1.1434E+00	6.2012E-05
3.5000E+02	1.1673E+00	6.4458E-05
4.0000E+02	1.1912E+00	6.1192E-05
4.5000E+02	1.2150E+00	6.9218E-05
5.0000E+02	1.2389E+00	7.2[illegible]E-05
6.0000E+02	1.2867E+00	8.1421E-05
7.0000E+02	1.3345E+00	8.9427E-05
8.0000E+02	1.3823E+00	9.1063E-05
9.0000E+02	1.4300E+00	8.9727E-05
1.0000E+03	1.4778E+00	8.9160E-05

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

30 DEGREE C HELIUM ISOTHERM, 303.137 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004794810E-00	3.15947E-06
2.000E-00	1.0009588222E-00	6.23447E-06
5.000E-00	1.0023960101E-00	1.52402E-05
1.000E+01	1.0047885532E-00	2.97419E-05
2.500E+01	1.0119457139E-00	7.03152E-05
5.000E+01	1.0238080311E-00	1.29680E-04
7.500E+01	1.0355908684E-00	1.80038E-04
1.000E+02	1.0472979168E-00	2.22491E-04
1.250E+02	1.0589326418E-00	2.58010E-04
1.500E+02	1.0704982825E-00	2.87495E-04
2.000E+02	1.0934341394E-00	3.31710E-04
2.500E+02	1.1161268855E-00	3.61325E-04
3.000E+02	1.1385943047E-00	3.81698E-04
3.500E+02	1.1608505673E-00	3.97297E-04
4.000E+02	1.1829062301E-00	4.11669E-04
4.500E+02	1.2047682357E-00	4.27411E-04
5.000E+02	1.2264399134E-00	4.46114E-04
6.000E+02	1.2692075328E-00	4.92962E-04
7.000E+02	1.3111634469E-00	5.39900E-04
8.000E+02	1.3522041946E-00	5.54892E-04
9.000E+02	1.3921684953E-00	5.14366E-04
1.000E+03	1.4308372487E-00	5.65639E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004592130E-00	7.37976E-07
2.000E-00	1.0009183177E-00	1.45752E-06
5.000E-00	1.0022949829E-00	3.56530E-06
1.000E+01	1.0045872689E-00	6.95522E-06
2.500E+01	1.0114480780E-00	1.63898E-05
5.000E+01	1.0228300518E-00	3.00163E-05
7.500E+01	1.0341475322E-00	4.13593E-05
1.000E+02	1.0454020776E-00	5.07215E-05
1.250E+02	1.0565951946E-00	5.83736E-05
1.500E+02	1.0677283375E-00	6.45676E-05
2.000E+02	1.0898202587E-00	7.35087E-05
2.500E+02	1.1116884351E-00	7.92363E-05
3.000E+02	1.1333426273E-00	8.31670E-05
3.500E+02	1.1547917630E-00	8.64324E-05
4.000E+02	1.1760439364E-00	8.98867E-05
4.500E+02	1.1971064087E-00	9.41196E-05
5.000E+02	1.2179856078E-00	9.94467E-05
6.000E+02	1.2592157326E-00	1.12963E-04
7.000E+02	1.2997690705E-00	1.25317E-04
8.000E+02	1.3396670506E-00	1.24380E-04
9.000E+02	1.3789177707E-00	9.86951E-05
1.000E+03	1.4175159977E-00	1.17819E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

40 DEGREE C HELIUM ISOTHERM, 313.137 K (111)

PRESSURE, ATM	Z	SZ
1.0000E-00	1.0004592130E-00	7.5791[illegible]E-07
2.0000E-00	1.0009163172E-00	1.4572[illegible]E-06
5.0000E-00	1.0022948705E-00	3.5653[illegible]E-06
1.0000E+01	1.0045872645E-00	6.9552[illegible]E-06
2.5000E+01	1.0114460780E-00	1.6398[illegible]E-05
5.0000E+01	1.0229400[illegible]E-00	3.1014[illegible]E-05
7.5000E+01	1.0343[illegible]	4.1359[illegible]E-05
1.0000E+02	1.0458[illegible]E-00	5.0721[illegible]E-05
1.2500E+02	1.0574[illegible]E-00	5.8[illegible]36E-05
1.5000E+02	1.0691[illegible]E-00	6.4[illegible]E-05
2.0000E+02	1.0924[illegible]E-00	7.3[illegible]E-05
2.5000E+02	1.1158[illegible]E-00	7.9[illegible]E-05
3.0000E+02	1.1393[illegible]E-00	8.3[illegible]E-05
3.5000E+02	1.1629[illegible]E-00	8.6[illegible]E-05
4.0000E+02	1.1866[illegible]E-00	8.9[illegible]E-05
4.5000E+02	1.2103[illegible]E-00	9.4[illegible]E-05
5.0000E+02	1.2342[illegible]E-00	9.9[illegible]E-05
6.0000E+02	1.2[illegible]	1.2[illegible]E-04
7.0000E+02	1.2[illegible]E-00	1.2[illegible]E-04
8.0000E+02	1.3[illegible]E-00	1.2[illegible]E-04
9.0000E+02	1.3[illegible]E-00	9.8[illegible]E-05
1.0000E+03	1.4[illegible]E-00	1.1[illegible]E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004435087E-00	7.22140E-07
2.000E-00	1.0008869122E-00	1.42668E-06
5.000E-00	1.0022164933E-00	3.49138E-06
1.000E+01	1.0044303698E-00	6.81365E-06
2.500E+01	1.0110564358E-00	1.60673E-05
5.000E+01	1.0220488192E-00	2.94491E-05
7.500E+01	1.0329788191E-00	4.06035E-05
1.000E+02	1.0438480473E-00	4.98204E-05
1.250E+02	1.0546580584E-00	5.73592E-05
1.500E+02	1.0654103498E-00	6.34617E-05
2.000E+02	1.0867474776E-00	7.22495E-05
2.500E+02	1.1078702674E-00	7.78156E-05
3.000E+02	1.1287886412E-00	8.15343E-05
3.500E+02	1.1495116067E-00	8.45089E-05
4.000E+02	1.1700472570E-00	8.75715E-05
4.500E+02	1.1904027707E-00	9.12910E-05
5.000E+02	1.2105844121E-00	9.59663E-05
6.000E+02	1.2504465624E-00	1.07801E-04
7.000E+02	1.2896655322E-00	1.18435E-04
8.000E+02	1.3282585143E-00	1.16962E-04
9.000E+02	1.3662280699E-00	9.36787E-05
1.000E+03	1.4035621287E-00	1.13217E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTERNAL PRESSURES - CONTINUED

50 DEGREE C HELIUM ISOTHERM, 323.136 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.000443507E-00	7.221 6E-07
2.000E-00	1.000885912E-00	1.4286E-06
5.000E-00	1.002216413E-00	3.4913E-06
1.000E+01	1.004430362E-00	6.8136E-06
2.500E+01	1.011058435E-00	1.6067E-05
5.000E+01	1.022048819E-00	2.0449E-05
7.500E+01	1.032978819E-00	4.0435E-05
1.000E+02	1.043848047E-00	4.5026E-05
1.250E+02	1.054658058E-00	5.7352E-05
1.500E+02	1.065410349E-00	6.3417E-05
2.000E+02	1.086747746E-00	7.2495E-05
2.500E+02	1.107870247E-00	7.7136E-05
3.000E+02	1.128788641E-00	8.1345E-05
3.500E+02	1.149511605E-00	8.5087E-05
4.000E+02	1.170047257E-00	8.7515E-05
4.500E+02	1.190402707E-00	9.1291E-05
5.000E+02	1.210584412E-00	9.5964E-05
6.000E+02	1.250946457E-00	1.0401E-04
7.000E+02	1.289466532E-00	1.1463E-04
8.000E+02	1.328259814E-00	1.1944E-04
9.000E+02	1.366228069E-00	9.3478E-05
1.000E+03	1.403562128E-00	1.1321E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

60 DEGREE C HELIUM ISOTHERM, 333.136 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004289604E-00	3.97168E-07
2.000E-00	1.0008578174E-00	7.84799E-07
5.000E-00	1.0021437681E-00	1.92116E-06
1.000E+01	1.0042849596E-00	3.75063E-06
2.500E+01	1.0106932260E-00	8.85202E-06
5.000E+01	1.0213235338E-00	1.62456E-05
7.500E+01	1.0318927397E-00	2.24276E-05
1.000E+02	1.0424025930E-00	2.75533E-05
1.250E+02	1.0528547758E-00	3.17618E-05
1.500E+02	1.0632509031E-00	3.51827E-05
2.000E+02	1.0838811157E-00	4.01400E-05
2.500E+02	1.1043048083E-00	4.33020E-05
3.000E+02	1.1245324846E-00	4.54104E-05
3.500E+02	1.1445735744E-00	4.70644E-05
4.000E+02	1.1644364335E-00	4.87212E-05
4.500E+02	1.1841283438E-00	5.06995E-05
5.000E+02	1.2036555132E-00	5.31782E-05
6.000E+02	1.2422350914E-00	5.95480E-05
7.000E+02	1.2802033531E-00	6.56678E-05
8.000E+02	1.3175713001E-00	6.60511E-05
9.000E+02	1.3543327514E-00	5.46861E-05
1.000E+03	1.3904643433E-00	5.52376E-05

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

60 DEGREE C HELIUM ISOTHERM, 333.156 K (ITS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.000[illegible]E-00	3.971[illegible]E-07
2.000E-00	1.000[illegible]E-00	7.[illegible]E-07
5.000E-00	1.00[illegible]E-00	1.[illegible]E-06
1.000E+01	1.01[illegible]E-00	3.[illegible]E-06
2.500E+01	1.01[illegible]E-00	8.[illegible]E-06
5.000E+01	1.02[illegible]E-00	1.[illegible]E-05
7.500E+01	1.03[illegible]E-00	2.[illegible]E-05
1.000E+02	1.04[illegible]E-00	2.[illegible]E-05
1.250E+02	1.05[illegible]E-00	3.[illegible]E-05
1.500E+02	1.06[illegible]E-00	3.[illegible]E-05
2.000E+02	1.08[illegible]E-00	4.[illegible]E-05
2.500E+02	1.10[illegible]E-00	4.[illegible]E-05
3.000E+02	1.12[illegible]E-00	4.[illegible]E-05
3.500E+02	1.14[illegible]E-00	4.[illegible]E-05
4.000E+02	1.16[illegible]E-00	4.[illegible]E-05
4.500E+02	1.18[illegible]E-00	5.[illegible]E-05
5.000E+02	1.20[illegible]E-00	5.[illegible]E-05
6.000E+02	1.24[illegible]E-00	5.[illegible]E-05
7.000E+02	1.28[illegible]E-00	6.[illegible]E-05
8.000E+02	1.31[illegible]E-00	6.[illegible]E-05
9.000E+02	1.35[illegible]E-00	5.[illegible]E-05
1.000E+03	1.39[illegible]E-00	5.[illegible]E-05

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

70 DEGREE C HELIUM ISOTHERM, 343.136 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004159994E-00	7.20575E-07
2.000E-00	1.0008318929E-00	1.42447E-06
5.000E-00	1.0020789390E-00	3.48807E-06
1.000E+01	1.0041552435E-00	6.80780E-06
2.500E+01	1.0103685368E-00	1.60373E-05
5.000E+01	1.0206730579E-00	2.93187E-05
7.500E+01	1.0309157978E-00	4.03102E-05
1.000E+02	1.0410988956E-00	4.93206E-05
1.250E+02	1.0512243957E-00	5.66276E-05
1.500E+02	1.0612942471E-00	6.24895E-05
2.000E+02	1.0812743244E-00	7.08238E-05
2.500E+02	1.1010528179E-00	7.60389E-05
3.000E+02	1.1206418960E-00	7.95543E-05
3.500E+02	1.1400522053E-00	8.24848E-05
4.000E+02	1.1592928708E-00	8.56479E-05
4.500E+02	1.1783714955E-00	8.95726E-05
5.000E+02	1.1972941607E-00	9.44867E-05
6.000E+02	1.2346883282E-00	1.06390E-04
7.000E+02	1.2714935870E-00	1.15232E-04
8.000E+02	1.3077038018E-00	1.08614E-04
9.000E+02	1.3432884884E-00	8.35475E-05
1.000E+03	1.3781928134E-00	1.49960E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

70 DEGREE C HELIUM ISOTHERM, 343.136 K (TTS)

PRESSURE, ATM	Z	SZ
1.0000E-00	1.0004159994E-00	7.2057[illegible]E-07
2.0000E-00	1.0008318925E-00	1.4244[illegible]E-06
5.0000E-00	1.0023789734E-00	3.4060[illegible]E-06
1.0000E+01	1.0046185285E-00	6.8072[illegible]E-06
2.5000E+01	1.0103648364E-00	1.6837[illegible]E-05
5.0000E+01	1.0206173057[illegible]E-00	2.0318[illegible]E-05
7.5000E+01	1.0309157972E-00	4.0[illegible]E-05
1.0000E+02	1.0413098596E-00	4.[illegible]E-05
1.2500E+02	1.0517279[illegible]E-00	5.6[illegible]E-05
1.5000E+02	1.0621924[illegible]E-00	6.2[illegible]E-05
2.0000E+02	1.0827743[illegible]E-00	7.0[illegible]E-05
2.5000E+02	1.1034[illegible]E-00	7.4[illegible]E-05
3.0000E+02	1.1242[illegible]E-00	7.[illegible]E-05
3.5000E+02	1.1450[illegible]E-00	8.2[illegible]E-05
4.0000E+02	1.1659[illegible]E-00	8.5[illegible]E-05
4.5000E+02	1.1868[illegible]E-00	9.[illegible]E-05
5.0000E+02	1.1912[illegible]E-00	9.4[illegible]E-05
6.0000E+02	1.2[illegible]E-00	1.0[illegible]E-04
7.0000E+02	1.2[illegible]E-00	1.1[illegible]E-04
8.0000E+02	1.3[illegible]E-00	1.0[illegible]E-04
9.0000E+02	1.3[illegible]E-00	8.[illegible]E-05
1.0000E+03	1.3[illegible]E-00	1.4[illegible]E-04

TABLE 7. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS FOR INTEGRAL PRESSURES - CONTINUED

80 DEGREE C HELIUM ISOTHERM, 353.138 K (TTS)

PRESSURE, ATM	Z	SZ
1.000E-00	1.0004024657E-00	8.77439E-07
2.000E-00	1.0008048333E-00	1.73492E-06
5.000E-00	1.0020113481E-00	4.24960E-06
1.000E+01	1.0040202540E-00	8.29673E-06
2.500E+01	1.0100324738E-00	1.95577E-05
5.000E+01	1.0200054276E-00	3.57873E-05
7.500E+01	1.0299207225E-00	4.92462E-05
1.000E+02	1.0397801481E-00	6.03040E-05
1.250E+02	1.0495854226E-00	6.92931E-05
1.500E+02	1.0593381927E-00	7.65228E-05
2.000E+02	1.0786924483E-00	8.68372E-05
2.500E+02	1.0978546577E-00	9.33052E-05
3.000E+02	1.1168354194E-00	9.76356E-05
3.500E+02	1.1356441875E-00	1.01177E-04
4.000E+02	1.1542892717E-00	1.04925E-04
4.500E+02	1.1727778378E-00	1.09535E-04
5.000E+02	1.1911159069E-00	1.15308E-04
6.000E+02	1.2273589182E-00	1.29460E-04
7.000E+02	1.2630435899E-00	1.40596E-04
8.000E+02	1.2981768982E-00	1.34426E-04
9.000E+02	1.3327475104E-00	1.04349E-04
1.000E+03	1.3667257854E-00	1.65841E-04

TABLE 8. - Parameters as a function of temperature

Isotherm, °C	N	B x 10^4, atm^{-1}	C x 10^8, atm^{-2}	D x 10^{11}, atm^{-3}	E x 10^{15}, atm^{-4}
-5	1.9943720±0.0000397	5.45058±0.00906	-6.8805±0.3208	2.3688±0.5266	-7.354±2.979
0	1.9941987 ±.0000300	5.35278 ±.00672	-6.9099 ±.2316	2.4479 ±.3709	-7.146±2.086
10	1.9943821 ±.0000204	5.13143 ±.00463	-6.2414 ±.1661	1.9222 ±.2768	-4.941±1.584
20	1.9940586 ±.0001091	4.96763 ±.02437	-6.5516 ±.8506	2.5537±1.3752	-7.806±7.678
25	1.9943844 ±.0000245	4.84539 ±.00503	-5.7232 ±.1662	1.7031 ±.2599	-4.279±1.419
30	1.9942853 ±.0001493	4.79551 ±.03049	-7.0017 ±.9743	4.5394±1.4796	-24.092±7.951
40	1.9942518 ±.0000325	4.59267 ±.00716	-5.4210 ±.2514	1.8013 ±.4102	-5.555±2.300
50	1.9943884 ±.0000318	4.43561 ±.00702	-5.2619 ±.2434	1.8716 ±.3905	-6.096±2.170
60	1.9944411 ±.0000178	4.29012 ±.00386	-5.1837 ±.1317	2.0449 ±.2079	-7.160±1.137
70	1.9944195 ±.0000312	4.16053 ±.00702	-5.3070 ±.2517	2.5356 ±.4173	-10.145±2.397
80	1.9944402 ±.0000384	4.02515 ±.00855	-4.9157 ±.3033	2.0997 ±.4968	-7.629±2.824

TABLE 8. - Parameters as a function of temperature

Temperature, °C	N	B x 10^4, atm^{-1}	C x 10^9, atm^{-2}	D x 10^{12}, atm^{-3}	E x 10^{15}, atm^{-4}
-5	1.9845370±0.0000197	5.4052±0.0090	-6.8805±0.7205	2.3648±0.7586	-7.1754±2.979
0	1.9941081 ± .0000300	5.3527± .0067	-6.9649 ± .1278	2.6479 ± .1708	-7.1464±2.086
10	1.9943831 ± .0000204	5.1314± .0043	-6.3418 ± .1801	1.9222 ± .1783	-4.9421±1.584
20	1.9940266 ± .0000141	4.4519± .0239	-5.5318 ± .8306	1.5717±1.3752	-1.2086±1.078
25	1.9943844 ± .0000243	4.3439± .0052	-5.7232 ± .1407	1.7081 ± .2308	-4.2294±1.419
30	1.9942851 ± .0001272	4.7491± .0304	[illegible]	[illegible]	[illegible]
40	1.9943918 ± .0000125	[illegible]	[illegible]	[illegible]	[illegible]
50	1.9943884 ± .0000119	[illegible]	[illegible]	[illegible]	[illegible]
60	1.9944411 ± .0000138	[illegible]	[illegible]	[illegible]	[illegible]
70	1.9944195 ± .0000112	[illegible]	[illegible]	[illegible]	[illegible]
80	1.9944402 ± .0000184	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 9. - Compressibility factors as a function of temperature

Isotherm, °C	Z (1 atm)	Z (200 atm)	Z (400 atm)	Z (800 atm)
-5	1.000544989±0.000000937	1.1064371±0.0000923	1.2083421±0.0001123	1.401127±0.000151
0	1.000535209 ±.000000696	1.1044761 ±.0000696	1.2044392 ±.0000839	1.393606 ±.000113
10	1.000513081 ±.000000478	1.1002780 ±.0000470	1.1963748 ±.0000575	1.378387 ±.000078
20	1.000496697 ±.000002516	1.0969237 ±.0002504	1.1896570 ±.0003042	1.365357 ±.000411
25	1.000484482 ±.000000521	1.0947480 ±.0000539	1.1856390 ±.0000671	1.357970 ±.000091
30	1.000479481 ±.000003159	1.0934341 ±.0003317	1.1829062 ±.0004117	1.352204 ±.000555
40	1.000459213 ±.000000738	1.0898203 ±.0000735	1.1760439 ±.0000899	1.339667 ±.000124
50	1.000443509 ±.000000722	1.0867475 ±.0000722	1.1700473 ±.0000876	1.328259 ±.000117
60	1.000428960 ±.000000397	1.0838811 ±.0000401	1.1644364 ±.0000487	1.317571 ±.000066
70	1.000415999 ±.000000721	1.0812743 ±.0000708	1.1592929 ±.0000856	1.307704 ±.000109
80	1.000402466 ±.000000877	1.0786924 ±.0000868	1.1542893 ±.0001049	1.298177 ±.000134

TABLE 9. - Compressibility factors as a function of temperature

Isotherm, °C	Z (1 atm)	Z (200 atm)	Z (400 atm)	Z (800 atm)
-5	1.00054989±0.00000097	1.10643171±0.00009023	1.20834321±0.00011223	1.40112720±0.00013101
0	1.00053520 ±.00000096	1.10464765 ±.00006496	1.20464292 ±.00008199	1.39360606 ±.00011313
10	1.00051308 ±.00000078	1.10027280 ±.00004270	1.19613728 ±.00005715	1.37838587 ±.00007878
20	1.00049669 ±.00000251	1.09692317 ±.00023904	1.18965370 ±.00030402	1.36533557 ±.00041111
25	1.00048482 ±.00000052	1.09472680 ±.00005399	1.18360980 ±.00006721	1.35797076 ±.00009[illegible]
30	1.00047948 ±.00000315	1.09342361 ±.00031317	1.18290642 ±.00041117	1.35222064 ±.00055[illegible]
40	1.00065921 ±.00000078	1.09862013 ±.00007235	1.17504039 ±.00008999	1.33960917 ±.00012[illegible]
50	1.00044350 ±.00000072	1.08472475 ±.00007222	1.17004721 ±.00008726	1.32823[illegible] ±.00011[illegible]
60	1.00042896 ±.00000097	1.08288111 ±.00006101	1.16444364 ±.00006807	1.31175[illegible] ±.00009[illegible]
70	1.00041599 ±.00000072	1.08127963 ±.00007108	1.15942929 ±.00008536	1.30770[illegible] ±.00009[illegible]
80	1.00040246 ±.00000087	1.07859[illegible] ±.00008[illegible]	1.15[illegible] ±.00007[illegible]	1.29817[illegible] ±.00013[illegible]

The temperature range of this work was not large enough to evaluate the temperature dependence of the parameters D and E; therefore, mean values are reported for these parameters,

$$D = (2.1349 \pm 0.1496) \times 10^{-11}, \text{ atm}^{-3}$$

$$E = (-6.811 \pm 0.840) \times 10^{-15}, \text{ atm}^{-4}.$$

When the parameter N is fitted to an equation of the form

$$N = N_1 + N_2 T \tag{4}$$

the following results are obtained;

$$N_1 = 1.993690 \pm 0.000400,$$

and

$$N_2 = (2.088 \pm 1.294) \times 10^{-6}.$$

This means the parameter N is slightly dependent on temperature. The temperature dependence was expected because not all parts of the compressibility volumes V_1 and V_2 have the same coefficient of thermal expansion.

Data obtained at 30° C were not consistent with the other data and were not included in the computations of temperature functions or mean values. Cause of the discrepancy of the 30° C data has not been ascertained.

DISCUSSION

All assumptions and sources of errors discussed in our previous report (4) also apply to the data of the present work. Stated

The temperature range of this work was not large enough to evaluate the temperature dependence of the parameters D and E; therefore, mean values are reported for these parameters.

$$D = (2.1249 \pm 0.1496) \times 10^{-11}, \ atm^{-3}$$

$$E = (-6.811 \pm 0.840) \times 10^{-16}, \ atm^{-4}.$$

When the parameter N is fitted to an equation of the form

$$N = N_1 + N_2 T \qquad (4)$$

the following results are obtained:

$$N_1 = 1.99369 \pm 0.00400,$$

and

$$N_2 = (2.088 \pm 1.294) \times 10^{-6}.$$

This means the parameter N is slightly dependent on temperature. The temperature dependence was expected because not all parts of the compressibility volumes V_1 and V_2 have the same coefficient of thermal expansion.

Data obtained at 30° C were not consistent with the other data and were not included in the computations of temperature functions or mean values. Cause of the discrepancy of the 30° C data has not been ascertained.

DISCUSSION

All assumptions and sources of errors discussed in our previous report (4) also apply to the data of the present work. Stated

standard deviations are estimates of the random errors associated with the quantities recorded in this report. Compressibility factors are believed to be accurate to better than 0.05 percent.

Table 10 shows a comparison of the compressibility data obtained in this investigation with the published 50° C data of Wiebe, Gaddy, and Heins (WGH) (10), the 50° C data of Blancett (ALB) (3), and the 30° C data of Johnson (CAJ) (8). The agreement is considered good, particularly when one considers that Wiebe, Gaddy, and Heins, and Johnson used a completely different experimental technique to obtain their data and a different functional equation to represent the compressibility isotherm. Also, one should note that their data were obtained some 30 years ago and changes have been made in the methods used to calibrate piston gages, changes have been made in devices to separate piston gage oil from the sample gas, as well as the other technological advances of recent years. Blancett made a small error in the distortion coefficients for his pressure vessels. He discovered the error (3, Additions and Corrections) after his calculations were completed. The comparison of table 10 is with Blancett's uncorrected data; his corrected calculations have not been published.

My equation:

$$Z_r = 1 + (-1.40152\times10^{-3}T^{-1/4} + 5.90633\times10^{-2}T^{-3/4})P_r + (2.4982\times10^{-7}T^{-1/4} - 8.6386\times10^{-6}T^{-3/4})P_r^2 + 2.1349\times10^{-11}P_r^3 - 6.811\times10^{-15}P_r^4 \quad , \qquad (5)$$

standard deviations are estimates of the random errors associated with the quantities recorded in this report. Compressibility factors are believed to be accurate to better than 0.05 percent.

Table 10 shows a comparison of the compressibility data obtained in this investigation with the published 50° C data of Wiebe, Gaddy, and Heins (WGH) (10), the 50° C data of Blancett (ALB) (7), and the 30° C data of Johnson (CAL) (8). The agreement is considered good, particularly when one considers that Wiebe, Gaddy, and Heins, and Johnson used a completely different experimental technique to obtain their data and a different functional equation to represent the compressibility isotherm. Also, one should note that their data were obtained some 30 years ago and changes have been made in the methods used to calibrate piston gages, changes have been made in devices to separate piston gage oil from the sample gas, as well as the other technological advances of recent years. Blancett made a small error in the distortion coefficients for his pressure vessels. He discovered the error (3, Additions and Corrections) after his calculations were completed. The comparison of Table 10 is with Blancett's uncorrected data; his corrected calculations have not been published.

My equation:

$$Z_r = 1 + (-1.46152\times10^{-6}T^{-4} + 5.90633\times10^{-2}T^{-3})P_r$$
$$+ (2.4982\times10^{-7}T^{-4} - 8.6386\times10^{-6}T^{-3})P_r^2$$
$$+ 2.1349\times10^{-11}P_r^3 - 6.811\times10^{-16}P_r^4 \quad , \qquad (5)$$

TABLE 10. - Comparison of compressibility factors from this work with published compressibility data

P, atm	$\frac{Z,HRC - Z,WGH(10)}{Z,HRC} \times 100$, at 50°C	$\frac{Z,HRC - Z,ALB(3)}{Z,HRC} \times 100$, at 50°C	$\frac{Z,HRC - Z,CAJ(8)}{Z,HRC} \times 100$, at 30°C
1	+0.0013	-0.00021	+0.00051
2	+.0025	-.00041	+.0010
5	+.0063	-.0010	+.0025
10	+.0094	-.0020	+.0048
25	+.030	-.0049	+.011
50	+.057	-.0092	+.019
75	+.081	-.013	+.025
100	+.10	-.017	+.028
125	+.12	-.020	+.030
150	+.14	-.023	+.030
200	+.16	-.029	+.028
250	+.18	-.034	+.024
300	+.20	-.039	+.019
350	+.21	-.043	+.016
400	+.21	-.047	+.014
450	+.22	-.050	+.014
500	+.22	-.054	+.017
600	+.22	-.059	
700	+.21	-.065	
800	+.20		
900	+.19		
1000	+.048		

TABLE 10. - Comparison of compressibility factors from this work with published compressibility data

P, atm	$\frac{Z_{HRC} - Z_{WGH}(10)}{Z_{HRC}}$ x 100, at 50°C	$\frac{Z_{HRC} - Z_{ALB}(3)}{Z_{HRC}}$ x 100, at 50°C	$\frac{Z_{HRC} - Z_{CAL}(8)}{Z_{HRC}}$ x 100, at 30°C
1	+0.0013	-0.00021	+0.00051
2	+.0025	-.00041	+.0010
5	+.0063	-.0010	+.0025
10	+.0094	-.0020	+.0048
25	+.030	-.0049	+.011
50	+.057	-.0092	+.019
75	+.081	-.013	+.025
100	+.10	-.017	+.028
125	+.12	-.020	+.030
150	+.14	-.023	+.030
200	+.16	-.029	+.028
250	+.18	-.034	+.024
300	+.20	-.039	+.019
350	+.21	-.043	+.016
400	+.21	-.047	+.014
450	+.22	-.050	+.014
500	+.22	-.054	+.017
600	+.22	-.059	
700	+.21	-.065	
800	+.20		
900	+.19		
1000	+.048		

where P_r' is in atmospheres and T is the thermodynamic temperature on the Kelvin scale, reproduces the compressibility factors of table 7 to within 0.07 percent at pressures to 800 atmospheres over the entire temperature range.

Thermodynamic properties of helium can be calculated by using equation 5, and this is planned as future work.

where P_r is in atmospheres and T is the thermodynamic temperature on the Kelvin scale, reproduces the compressibility factors of table 7 to within 0.07 percent at pressures to 800 atmospheres over the entire temperature range.

Thermodynamic properties of helium can be calculated by using equation 3, and this is planned as future work.

REFERENCES

1. Barieau, Robert E., and B. J. Dalton. A Method for Treating PVT Data from a Burnett Compressibility Apparatus. BuMines Rept. of Inv. 7020, September 1967, 34 pp.

2. _____. Nonlinear Regression and the Principle of Least Squares. A Method of Evaluating the Constants and a New Method for Calculating Variances and Covariances. BuMines Rept. of Inv. 6900, 1967, 21 pp.

3. Blancett, Allen Leroy. Volumetric Behavior of Helium-Argon Mixtures at High Pressures and Moderate Temperature. Ph.D. Thesis, The Univ. of Oklahoma, 1966, 228 pp., Univ. Microfilms, Inc., Ann Arbor, Mich., Order No. 66-14,196.

4. Briggs, Ted C., B. J. Dalton, and Robert E. Barieau. Compressibility Data for Helium at 0° C and Pressures to 800 Atmospheres. BuMines Rept. of Inv. (In Process).

5. Briggs, Ted C., and Robert E. Barieau. Elastic Pressure Distortion of the Volumes of a Burnett Compressibility Apparatus Over the Temperature Range 0° to 80° C. BuMines Rept. of Inv. 7136, June 1968, 32 pp.

6. Burnett, E. S. Compressibility Determinations Without Volume Measurements. J. Appl. Mech., v. 3, No. 4, December 1936, pp. A136-A140.

REFERENCES

1. Barieau, Robert E., and R. J. Daiton. A Method for Treating PVT Data from a Burnett Compressibility Apparatus. BuMines Rept. of Inv. 7020, September 1967, 34 pp.

2. _____. Nonlinear Regression and the Principle of Least Squares. A Method of Evaluating the Constants and a New Method for Calculating Variances and Covariances. BuMines Rept. of Inv. 6900, 1967, 21 pp.

3. Blancett, Allen Leroy. Volumetric Behavior of Helium-Argon Mixtures at High Pressures and Moderate Temperature. Ph.D. Thesis. The Univ. of Oklahoma, 1966, 228 pp., Univ. Microfilms, Inc., Ann Arbor, Mich., Order No. 66-14,196.

4. Briggs, Ted C., R. J. Daiton, and Robert E. Barieau. Compressibility Data for Helium at 0° C and Pressures to 800 Atmospheres. BuMines Rept. of Inv. (In Process).

5. Briggs, Ted C., and Robert E. Barieau. Elastic Pressure Distortion of the Volumes of a Burnett Compressibility Apparatus Over the Temperature Range 0° to 80° C. BuMines Rept. of Inv. 7136, June 1968, 32 pp.

6. Burnett, E. S. Compressibility Determinations Without Volume Measurements. J. Appl. Mech., v. 3, No. 4, December 1936, pp. A136-A140.

REFERENCES, continued

7. Dalton, B. J., and Robert E. Barieau. Thermodynamic Properties of Helium for Temperatures Between 200 and 475° K and Pressures to 1,000 Atmospheres Generated from the PVT Data on Helium Obtained by Wiebe, Gaddy, and Heins. Helium Research Center Internal Report No. 71, March 1965, 60 pp. On file at the Helium Research Center, Bureau of Mines, Amarillo, Tex.

8. Johnson, Clarence Albert. Preliminary Measurements on the Compressibility of Hydrogen and Helium at High Pressures. Measurements on the Thermal Expansion of Solids by Interference Methods. Ph.D. Thesis, Massachusetts Institute of Technology, 1939, pp. 1-27.

9. Preston-Thomas, H. and C. G. M. Kirby. Gas Thermometer Determinations of the Thermodynamic Temperature Scale in the Range -183° C to 100° C. Metrologia, v. 4, No. 1, 1968, p. 39.

10. Wiebe, R., V. L. Gaddy, and Conrad Heins, Jr. The Compressibility Isotherms of Helium at Temperatures from -70 to 200° and at Pressures to 1000 Atmospheres. J. Am. Chem. Soc., v. 53, No. 5, May 1931, pp. 1721-1725.

REFERENCES, continued

7. Dalton, B. J., and Robert E. Barieau. Thermodynamic Properties of Helium for Temperatures Between 200 and 415° K and Pressures to 1,000 Atmospheres Generated from the PVT Data on Helium Obtained by Wiebe, Gaddy, and Heins. Helium Research Center Internal Report No. 71, March 1965, 60 pp. On file at the Helium Research Center, Bureau of Mines, Amarillo, Tex.

8. Johnson, Clarence Albert. Preliminary Measurements on the Compressibility of Hydrogen and Helium at High Pressures. Measurements on the Thermal Expansion of Solids by Interference Methods. Ph.D. Thesis, Massachusetts Institute of Technology, 1939, pp. 1-27.

9. Preston-Thomas, H. and C. C. M. Kirby. Gas Thermometer Determinations of the Thermodynamic Temperature Scale in the Range -183° C to 100° C. Metrologia, v. 4, No. 1, 1968, p. 39.

10. Wiebe, R., V. L. Gaddy, and Conrad Heins, Jr. The Compressibility Isotherms of Helium at Temperatures from -70 to 200° and at Pressures to 1000 Atmospheres. J. Am. Chem. Soc., v. 53, No. 3, May 1931, pp. 1721-1725.